Final

Environmental Assessment

Demolition or Reuse of Structures 705, 706, and 736

Cavalier Air Force Station, North Dakota

September 2003

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This Final EA has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, as amended. This EA assesses the potential environmental impacts of the demolition or reuse of two buildings and a water reservoir at Cavalier Air Force Station. Resource areas analyzed include air quality, geological resources, water resources, cultural resources, noise environmental justice, asbestos, and solid waste. In addition to the Proposed Action, a Reuse Alternative, and the No Action Alternative were analyzed in the EA. No significant impacts were identified in the analysis.

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Abstract: This Final EA has been prepared in accordance with the *National Environmental Policy Act* (NEPA) of 1969, as amended. This EA assesses the potential environmental impacts of the demolition or reuse of two buildings and a water reservoir at Cavalier Air Force Station. Resource areas analyzed include air quality, geological resources, water resources, cultural resources, noise, environmental justice, asbestos, and solid waste. In addition to the Proposed Action, a Reuse Alternative, and the No Action Alternative were analyzed in the EA. No significant impacts were identified in the analysis.

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FONSI

FINDING OF NO SIGNIFICANT IMPACT

Demolition or Reuse of Structures
Cavalier Air Force Station, North Dakota

Pursuant to Section 102(2)(c) of the *National Environmental Policy Act* (NEPA) of 1969 and the Council on Environmental Quality regulations (40 CFR Sec. 1500-1508) implementing the procedural provisions of NEPA the Department of Defense gives notice that an Environmental Assessment (EA) has been prepared for the proposed demolition of two buildings and a water reservoir at Cavalier Air Force Station (AFS), North Dakota, attached and incorporated by reference. Based on the EA it has been determined that an Environmental Impact Statement (EIS) is not required for the Proposed Action.

PROPOSED ACTION AND ALTERNATIVES

The United States Air Force proposes to demolish two buildings and a water reservoir at Cavalier AFS, North Dakota. The purpose of the action is for Cavalier AFS to dispose of facilities that are excess to the needs of the current mission at Cavalier AFS, have outlived their usefulness, or present safety concerns to base personnel and their families. Also, a focused effort to consolidate storage space on the installation is necessary due to a history of storage dispersement throughout several buildings, making managing the stored spares, supplies, and equipment cumbersome.

The **Proposed Action** is to demolish Bldgs 705 and 706 and the water reservoir (Structure #736) on Cavalier AFS. Approximately 5.5 acres of land would be disturbed. Bldg 705 was constructed when asbestos was used as a binder, filler, or insulator in many construction materials such as tile. Asbestos would be remediated through removal or encapsulation, as required, during the demolition process and disposed of in accordance with state regulations. The demolition contractor would reuse or recycle materials as applicable. Debris that cannot be reused or recycled would be managed as inert waste and taken to an inert waste landfill. Metal wastes such as washers, dryers, and other scrap metal may be stockpiled at an inert waste landfill for recycling. Debris not reused, recycled, or considered as inert waste would be disposed of in the Grand Forks sanitary landfill.

Prior to the demolition of the reservoir, the water would need to be drained. There are approximately three million gallons of water remaining in the reservoir from rain/snow. The water would be pumped out into the installation's sanitary lagoon. The asphalt liner that covers the reservoir bottom, inside slopes, and top of dike would either be removed and stockpiled for reuse on the installation or by the county or the top and sides would be collapsed into the reservoir and covered with fill dirt. After demolition, the land would be leveled and restored to its preconstructed pristine state.

A **Reuse Alternative** is to offer the buildings for sale or give the buildings to someone who is willing to pay the cost of moving them onto their site. This Alternative would require removing asbestos tiles from Bldgs 705 and 706 prior to them being offered for sale. The buildings could be offered for sale through the General Services Administration. The water reservoir would be demolished as described under the Proposed Action.

Under the **No Action Alternative**, Bldgs 705 and 706 would not be demolished or offered for sale and the water reservoir would not be demolished. This Alternative would not meet the installation's overall goal to ensure the highest possible quality of life for the Cavalier AFS community and prevent potential safety hazards.

FINDINGS

The following paragraphs summarize impacts that would likely occur from implementing any of the alternatives. In accordance with 40 CFR Sec. 1502.15, the resource areas that would not be impacted by the proposed demolition were not evaluated in the EA. The resource areas that would not be impacted include biological resources, transportation, utilities, lead-based paint, underground storage tanks, polychlorinated biphenyls, the Installation Restoration Program, and hazardous materials and wastes. There would be no impacts to areas of recreational, ecological, scenic, or aesthetic importance.

The Proposed Action and Reuse Alternative would have short-term but not significant impacts on **air quality** generated by heavy equipment and earth-moving activities during the demolition. The No Action Alternative would not change existing air quality at Cavalier AFS.

Impacts to **geological resources** would result primarily from excavation, grading and compaction during demolition activities. These activities would affect soils and topography and a shallow layer of the underlying geology in some areas. The Proposed Action would result in about 5.5 acres being disturbed; impacts to soils and the underlying geology would not be significant. About 5 acres would be disturbed under the Reuse Alternative, impacts would not be significant. The No Action Alternative would not impact geological resources.

Direct impacts to **water resources** would result primarily from disturbing the ground during demolition and from altering surface hydrology. Short-term disturbances from demolition activities could cause wind and water erosion, which could lead to increased sedimentation of nearby surface waters. Implementing best management practices would reduce the potential for erosion and sedimentation. Impacts to water resources would not be significant under the Proposed Action or Reuse Alternative. Water resources would not change under the No Action Alternative.

There are no known **cultural resources** within the project area that would be affected as a result of the Proposed Action or Reuse Alternative. Demolition would occur at previously disturbed areas; therefore no significant impacts are anticipated on archaeological resources. Coordination with the State Historic Preservation Officer determined that there would be no adverse effect from demolition of the two buildings or the water reservoir. There would be no impacts to cultural resources from the No Action Alternative.

The impacts on the **noise** environment are related to the magnitude and duration of the noise levels generated during demolition and the proximity of noise-sensitive receptors to the noise source. Noise generated during the demolition activities would not affect sensitive receptors and the impacts would not be significant. Noise levels would not change under the No Action Alternative.

No significant **environmental justice** impacts were identified from the Alternatives. Activities related to demolition of Bldgs 705, 706, and the water reservoir were evaluated to determine if they would disproportionately impact minority populations or low-income populations, or children. None of the impacts from proposed demolition of the facilities would be significant, and they would not disproportionately impact minority populations or low-income populations, or children.

The removal and disposal of **asbestos** as part of the Proposed Action or Reuse Alternative would not result in any significant impacts. Asbestos would not be removed from Bldgs 705 and 706 under the No Action Alternative. Impacts would not be significant.

Demolition activities would temporarily increase the amount of **solid waste** generated by the base. Demolition debris would be disposed of in an inert solid waste landfill. The short-term increase in demolition debris would not have a significant impact on local landfills. There would be no long-term impacts to solid waste generation at Cavalier AFS. The Reuse Alternative would generate less solid waste, and impacts would not be significant. Demolition debris would not be generated under the No Action Alternative.

There would be no significant **cumulative impacts.**

CONCLUSION

Based on the attached EA, I conclude that the environmental effects of the Proposed Action and Alternatives analyzed are not significant and the preparation of an EIS is not warranted.

Edward M. Rivera
Lt Col, USAF
Commander

8 Sep 03
Date

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EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

The United States Air Force proposes to demolish two buildings and a water reservoir at Cavalier Air Force Station (AFS), North Dakota. The purpose of the action is for Cavalier AFS to dispose of facilities that are excess to the needs of the current mission at Cavalier AFS, have outlived their usefulness, or present safety concerns to base personnel and their families. Also, a focused effort to consolidate storage space on the installation is necessary due to a history of storage dispersement throughout several buildings, making managing the stored spares, supplies, and equipment cumbersome.

The **Proposed Action** is to demolish Bldgs 705 and 706 and the water reservoir (Structure #736) on Cavalier AFS. Approximately 5.5 acres of land would be disturbed. Bldg 705 was constructed when asbestos was used as a binder, filler, or insulator in many construction materials such as tile. Asbestos would be remediated through removal or encapsulation, as required, during the demolition process and disposed of in accordance with state regulations. The demolition contractor would reuse or recycle materials as applicable. Debris that cannot be reused or recycled would be managed as inert waste and taken to an inert waste landfill. Metal wastes such as washers, dryers, and other scrap metal may be stockpiled at an inert waste landfill for recycling. Debris not reused, recycled, or considered as inert waste would be disposed of in the Grand Forks County sanitary landfill.

Prior to the demolition of the reservoir, the water would need to be drained. There are approximately three million gallons of water remaining in the reservoir from rain/snow. The water would be pumped out into the installation's sanitary lagoon. The asphalt liner that covers the reservoir bottom, inside slopes, and top of dike would either be removed and stockpiled for reuse on the installation or by the county or the top and sides would be collapsed into the reservoir and covered with fill dirt. After demolition, the land would be leveled and restored to its preconstructed pristine state.

A **Reuse Alternative** is to offer the buildings for sale or give the buildings to someone who is willing to pay the cost of moving them onto their site. This Alternative would require removing asbestos containing material from Bldgs 705 and 706 prior to them being offered for sale. The buildings could be offered for sale through the General Services Administration. The water reservoir would be demolished as described under the Proposed Action.

Under the **No Action Alternative**, Bldgs 705 and 706 would not be demolished or offered for sale and the water reservoir would not be demolished. This Alternative would not meet the installation's overall goal to ensure the highest possible quality of life for the Cavalier AFS community and prevent potential safety hazards.

POTENTIAL ENVIRONMENTAL CONSEQUENCES

The following resource areas were analyzed for potential environmental consequences associated with the Proposed Action and Reuse Alternative. The No Action Alternative would not result in any new impacts.

Air Quality. The Proposed Action would have short-term, but not significant, impacts on air quality generated by heavy equipment and earth-moving activities during the demolition of the water storage reservoir and Bldgs 705 and 706. Under the Reuse Alternative, air quality impacts would be less, since less demolition is involved. The No Action Alternative would not change air quality levels at Cavalier AFS.

Geological Resources. Impacts to geological resources would result primarily from disturbance of the ground from demolition activities. These activities would affect a shallow layer of the underlying geology in some areas. Excavation, grading, and compaction during demolition would directly impact topography and soils. The Proposed Action would result in about 5.5 acres being disturbed; impacts to soils and the underlying geology would not be significant. About 5 acres would be disturbed under the Reuse Alternative, with slightly less impact than the Proposed Action. Geological resources would not be impacted under the No Action Alternative.

Water Resources. Direct impacts to water resources would result primarily from disturbing the ground during demolition and from altering surface hydrology. The impacts would not be significant. Short-term disturbances from demolition activities could cause wind and water erosion, which could lead to increased sedimentation of nearby surface waters. Implementing best management practices would reduce the potential for erosion and sedimentation. Impacts to water resources would not be significant under the Reuse Alternative. Water resources would not be affected under the No Action Alternative.

Cultural Resources. There are no known cultural resources within the project area that would be affected as a result of the Proposed Action or Reuse Alternative. Demolition would occur at previously disturbed areas; therefore no significant impacts are anticipated on archaeological resources. Coordination with the North Dakota State Historic Preservation Officer determined that there would be "no adverse effect" from demolition of the two buildings and water reservoir. There would be no impacts to cultural resources from the No Action Alternative.

Noise. The impacts on the noise environment are related to the magnitude and duration of the noise levels generated during demolition and the proximity of noise-sensitive receptors to the noise source. Noise would be generated during the demolition activities, but the impacts would not be significant. Noise levels would not change under the No Action Alternative.

Environmental Justice. Activities related to demolition of Bldgs 705, 706, and the water reservoir were evaluated to determine if they would disproportionately impact minority populations or low-income populations, or children. None of the impacts from proposed demolition of the facilities would be significant, and they would not disproportionately impact minority populations or low-income populations, or children. No significant environmental justice impacts were identified from the Alternatives.

Asbestos. The removal and disposal of asbestos as part of the Proposed Action or Reuse Alternative would not result in any significant impacts. Asbestos would not be removed from Bldgs 705 and 706 under the No Action Alternative. Impacts would not be significant.

Solid Waste. Demolition activities would temporarily increase the amount of solid waste generated by the base. Demolition debris would be disposed of in an inert solid waste landfill. The short-term increase in demolition debris would not have a significant impact. There would be no long-term impacts to solid waste generation at Cavalier AFS. The Reuse Alternative would generate less solid waste, and impacts would not be significant. Demolition debris would not be generated under the No Action Alternative.

There are no significant **cumulative impacts.**

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ACRONYMS AND ABBREVIATIONS

ACRONYMS/ABBREVIATIONS

Units of Measure

mg/L	Milligrams per liter
pH	alkalinity/acidity factor
µg/L	Micrograms per liter

Acronyms and Abbreviations

ABM	Anti-Ballistic Missile
ACM	Asbestos containing material
AFS	Air Force Station
AFCEE	Air Force Center for Environmental Excellence
Bldg	Building
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CO	Carbon monoxide
dB	Decibel
dBA	"A-weighted" decibel
DOI	Department of Interior
EA	Environmental assessment
EO	Executive Order
FONSI	Finding of No Significant Impact
H_2S	Hydrogen sulfide
HABS	Historic American Building Survey
HAER	Historic American Engineering Record
HAP	Hazardous air pollutants
Leq	Equivalent sound level
NAAQS	National Ambient Air Quality Standards
NDAAQS	North Dakota Ambient Air Quality Standards
NDAC	North Dakota Administrative Code
NDDH	North Dakota Department of Health
NEPA	National Environmental Policy Act
NESHAP	National Emission Standards for Hazardous Air Pollutants
NO_2	Nitrogen dioxide
NO_x	Nitrogen oxides

NPDES	National Pollutant Discharge Elimination System
O_3	Ozone
PAR	Perimeter Acquisition Radar
Pb	Lead
PM_{10}	Particulate matter 10 microns in diameter
$PM_{2.5}$	Particulate matter 2.5 microns in diameter
ppm	Parts per million
PSD	Prevention of Significant Deterioration
ROI	Region of influence
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
SO_2	Sulfur dioxide
SO_x	Sulfur oxide
SRMSC	Stanley R. Mickelsen Safeguard Complex
TDS	Total dissolved solids
TPY	Tons per year
TSI	Thermal system insulation
TSP	Total suspended particles
USAF	United States Air Force
USBC	United States Bureau of Census
USEPA	United States Environmental Protection Agency
USC	United States Code
USGS	United States Geological Survey
VOC	Volatile organic compounds

CHAPTER 1

PURPOSE OF AND NEED FOR ACTION

1. PURPOSE AND NEED FOR ACTION

This section includes an introduction and then describes the purpose and need for the action, the public review process, and the location of Cavalier Air Force Station (AFS), North Dakota.

1.1 INTRODUCTION

The United States Air Force proposes to demolish two buildings and a water reservoir at Cavalier AFS. The *National Environmental Policy Act* (NEPA) of 1969, as amended, requires Federal agencies to consider environmental consequences in their decision-making process. The President's Council on Environmental Quality (CEQ) issued regulations to implement NEPA that include provisions for both the content and procedural aspects of the required environmental analysis. The Air Force has prepared this environmental assessment (EA) through adherence to procedures set forth in the CEQ regulations (Title 40 Code of Federal Regulations (CFR) 1500-1508) and 32 CFR 989, 15 Jul 99, as amended 28 Mar 01 (*Air Force Environmental Impact Analysis Process*). These Federal regulations establish both the administrative process and substantive scope of the environmental impact evaluation, designed to ensure deciding authorities have a proper understanding of the potential environmental consequences of a contemplated course of action. This EA provides an analysis of potential environmental consequences that could result from the implementation of the Proposed Action or Alternatives.

1.2 PURPOSE AND NEED FOR PROPOSED ACTION

The purpose of the action is for Cavalier AFS to dispose of facilities that are excess to the needs of the current mission at Cavalier AFS, have outlived their usefulness, or present safety concerns to base personnel and their families. Also, a focused effort to consolidate storage space on the installation is necessary due to a history of storage dispersement throughout several buildings, making managing the stored spares, supplies, and equipment cumbersome (USAF, 1999a).

Building (Bldg) 705 is one-story and made of semi-permanent construction, suitable and appropriate to serve a specific purpose for a period from 5 to 25 years (USAF, 2000a). The gross floor area of the building is 9,432 square feet. Fifteen of the rooms are covered with vinyl asbestos floor tile. Utilities to the building include electric, gas, water, sewer, and telephone. Bldg 705 has been used exclusively for storage for the past 20 years (Kotchman, 2003). Bldg 705 cannot be improved to accommodate new functions due to its age and method of construction (USAF, 1999a).

Bldg 706 was the first structure on Cavalier AFS and is currently used for mail inspection and storage. This building is also one-story and considered semi-permanent construction suitable and appropriate to serve a specific purpose for a period of 5 to 25 years (USAF, 2000a). The gross floor area of the bldg is 1,476 square feet. Utilities to the building include electric, gas, water, sewer, and telephone. Bldg 706 cannot be improved to accommodate new functions due to its age and method of construction (USAF, 1999a).

Structure 736 is an open water storage reservoir with a nine million gallon capacity. The reservoir has a maximum depth of 17 feet of water below the spillway crest elevation. The

reservoir is approximately 10 feet below ground surface grade and approximately 8 feet above. The reservoir was isolated from the potable water system in 1997 and the inlet line was disconnected and capped (USAF, 2000a). The outlet line was disconnected after the corresponding pump in facility 735 was also disconnected in 1997. The retaining dike of the reservoir is constructed of earth fill with subbase and base courses. The reservoir bottom, inside slopes, and top of dike have bituminous surfacing which serves as the liner. The reservoir includes two intake structures, one outlet structure, and one overflow structure. The structure is now considered a safety hazard due to poor fencing around the perimeter and standing water at the reservoir bottom.

Criteria for demolition of the buildings and water reservoir is in accordance with the installation's overall goal to ensure the highest possible quality of life for the Cavalier AFS community. Replacement of vintage buildings is warranted to maintain quality of life excellence at the installation and prevent safety hazards.

1.3 PUBLIC REVIEW PROCESS

Advertisements announcing the availability of the Draft EA and Finding of No Significant Impact (FONSI) for public review were published in the Cavalier County Republican and Cavalier Chronicle newspapers on August 20th and 25th, 2003, respectively. Copies of the EA were placed in the Cavalier Public Library and Cavalier County Public Library. No public comments were received.

1.4 LOCATION OF THE PROPOSED ACTION

Cavalier AFS is located two miles south of North Dakota Highway 5 approximately 15 miles south of the Canadian border, 45 miles west of the Minnesota border, and 100 miles north-northwest of Grand Forks, North Dakota (see Figure 1.4-1). Access to the installation is by State Highway 89 from State Highway 5. The area surrounding Cavalier AFS is sparsely populated, consisting of pastures, wooded areas, cultivated cropland, bodies of water, and a few incorporated, industrial, or urban areas. Agriculture is the primary industry in Pembina County, where the installation encompasses approximately 280 acres.

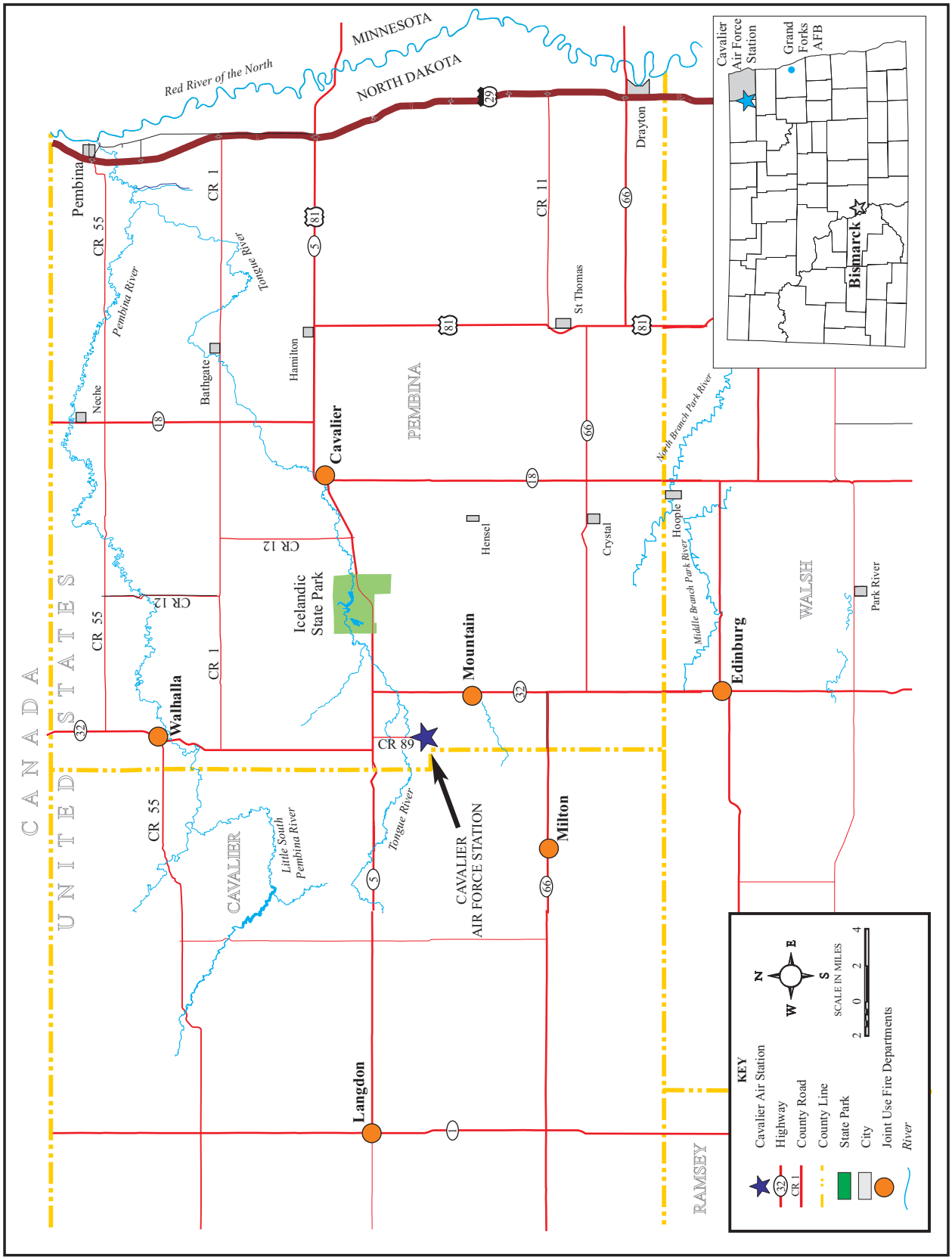

Figure 1.4-1. Location of Cavalier Air Force Station

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CHAPTER 2

DESCRIPTION OF THE ALTERNATIVES INCLUDING THE PROPOSED ACTION

2. DESCRIPTION OF THE ALTERNATIVES INCLUDING THE PROPOSED ACTION

This section describes the Proposed Action, Reuse Alternative, No Action Alternative and concludes with a summary of environmental consequences based on the resource-specific analyses in Chapter 4.

2.1 PROPOSED ACTION

The Proposed Action is to demolish Bldgs 705 and 706 and the water reservoir (Structure #736) on Cavalier AFS (see Figure 2.1-1). Approximately 5.5 acres of land would be disturbed. Bldg 705 was constructed when asbestos was used as a binder, filler, or insulator in many construction materials such as tile. An asbestos survey and assessment was accomplished on Cavalier AFS in 1989 and identified asbestos in the floor tile bitumen, baseboard, and pipe insulation in Bldg 705. In Bldg 706, an elbow on top of the boiler room water heater contains seven percent chrysotile asbestos insulation (Kotchman, 2003). Asbestos would be remediated through removal or encapsulation, as required, during the demolition process and disposed of in accordance with state regulations. The demolition contractor would reuse or recycle materials as applicable. Debris that cannot be reused or recycled would be managed as inert waste and taken to an inert waste landfill. Metal wastes such as washers, dryers, and other scrap metal may be stockpiled at an inert waste landfill for recycling. Debris not reused, recycled, or considered as inert waste would be disposed of in the Grand Forks County sanitary landfill. All utilities would be disconnected prior to demolition.

Prior to the demolition of the reservoir, Structure 736, the water would need to be drained (see Figure 2.1-2). There are approximately three million gallons of water remaining in the reservoir from rain/snow. The water would be pumped out into the installation's sanitary sewage lagoon system which has three cells. Cell 1, which is the first receiving sanitary sewer discharge, has a listed capacity of 6.175 million gallons. Cell 2, which is used for Cell 1 overflow, has a listed capacity of 15.69 million gallons. Cell 3, which is used for the land farm, the capacity is not known but the dimensions are 311 feet by 797 feet with a depth of two to three feet. A dewatering permit would not be required if the water is transferred into one of the installation's lagoon cells (Kowalski, 2003). The asphalt liner that covers the reservoir bottom, inside slopes, and top of dike would either be removed and stockpiled for reuse on the installation or by the county or the top and sides would be collapsed into the reservoir and covered with fill dirt. If the asphalt is collapsed and buried, it would be considered waste disposal and a variance would be required (Tillotson, 2003). No variance would be required if the asphalt is removed and recycled or reused (Tillotson, 2003). After demolition, the land would be leveled and restored to its preconstructed pristine state.

2.2 REUSE ALTERNATIVE

An Alternative to demolishing Bldgs 705 and 706 is to offer the buildings for sale or give the buildings to someone who is willing to pay the cost of moving them onto their site. This Alternative would require removing asbestos containing material from Bldgs 705 and 706 prior to them being offered for sale. The bldgs could be offered for sale through the

General Services Administration who covers the disposal process in accordance with Public Law 100-180, Section 2325 *United States Code* (U.S.C.), 10 U.S.C. Sec. 9781). The water reservoir would be demolished as described under the Proposed Action.

2.3 NO ACTION ALTERNATIVE

The No Action Alternative would be not to demolish Structure 736 and not to demolish or offer for sale Bldgs 705 and 706. This Alternative would not meet the installation's overall goal to ensure the highest possible quality of life for the Cavalier AFS community and prevent potential safety hazards.

2.4 SUMMARY OF ENVIRONMENTAL CONSEQUENCES

Based on discussions with Air Force personnel, and comparisons with similar military activities, areas of potential concern for the Proposed Action, Reuse Alternative, and No Action Alternative have been identified. The potential impacts were evaluated and are described in Chapter 4.

The intensity of an impact can be significant or not significant, as defined by 40 CFR 1508.27 (see Section 4 for further discussion on significance). Table 2.4-1 summarizes the impacts for each resource area under the Proposed Action, Reuse Alternative, and the No Action Alternative.

Table 2.4-1
Summary of Environmental Consequences

	Proposed Action	***Reuse Alternative***	***No Action Alternative***
		Air Resources	
Air Quality	Short-term but not significant increase in air emissions; no long-term impact	Short-term but not significant increase in air emissions; no long-term impact	No change in current level of emissions
		Geological Resources	
Geology	Short-term but not significant impact to underlying geological layers; no long-term impact	Short-term but not significant impact to underlying geological layers; no long-term impact	No impact to geology
Soils	Short-term but not significant disturbance to soils; no long-term impact	Short-term but not significant disturbance to soils; no long-term impact	No impact to soils
		Water Resources	
Groundwater	No significant impact to groundwater from excavation	No significant impact to groundwater from excavation	No impact to groundwater
Surface Water	No significant impact to surface water from erosion	No significant impact to surface water from erosion	No impact to surface water
		Cultural Resources	
Cultural Resources	No impacts to cultural resources or NRHP properties	No impacts to cultural resources or NRHP properties	No impacts to cultural resources or NRHP properties
		Noise	
Noise	No significant noise impacts	No significant noise impacts	No change in noise environment

Table 2.4-1 Summary of Environmental Consequences			
	Proposed Action	***Reuse Alternative***	***No Action Alternative***
Environmental Justice			
EJ	No impacts to minority populations, low-income populations, or children	No impacts to minority populations, low-income populations, or children	No impacts to minority populations, low-income populations, or children
Asbestos			
Asbestos	No significant impact from asbestos in facilities	No significant impact from asbestos in facilities	No significant impact from asbestos in facilities
Solid Waste			
Solid Waste	Temporary increase in solid waste generation, not a significant impact to local landfills	Temporary increase in solid waste generation, not a significant impact to local landfills	No change in solid waste generation

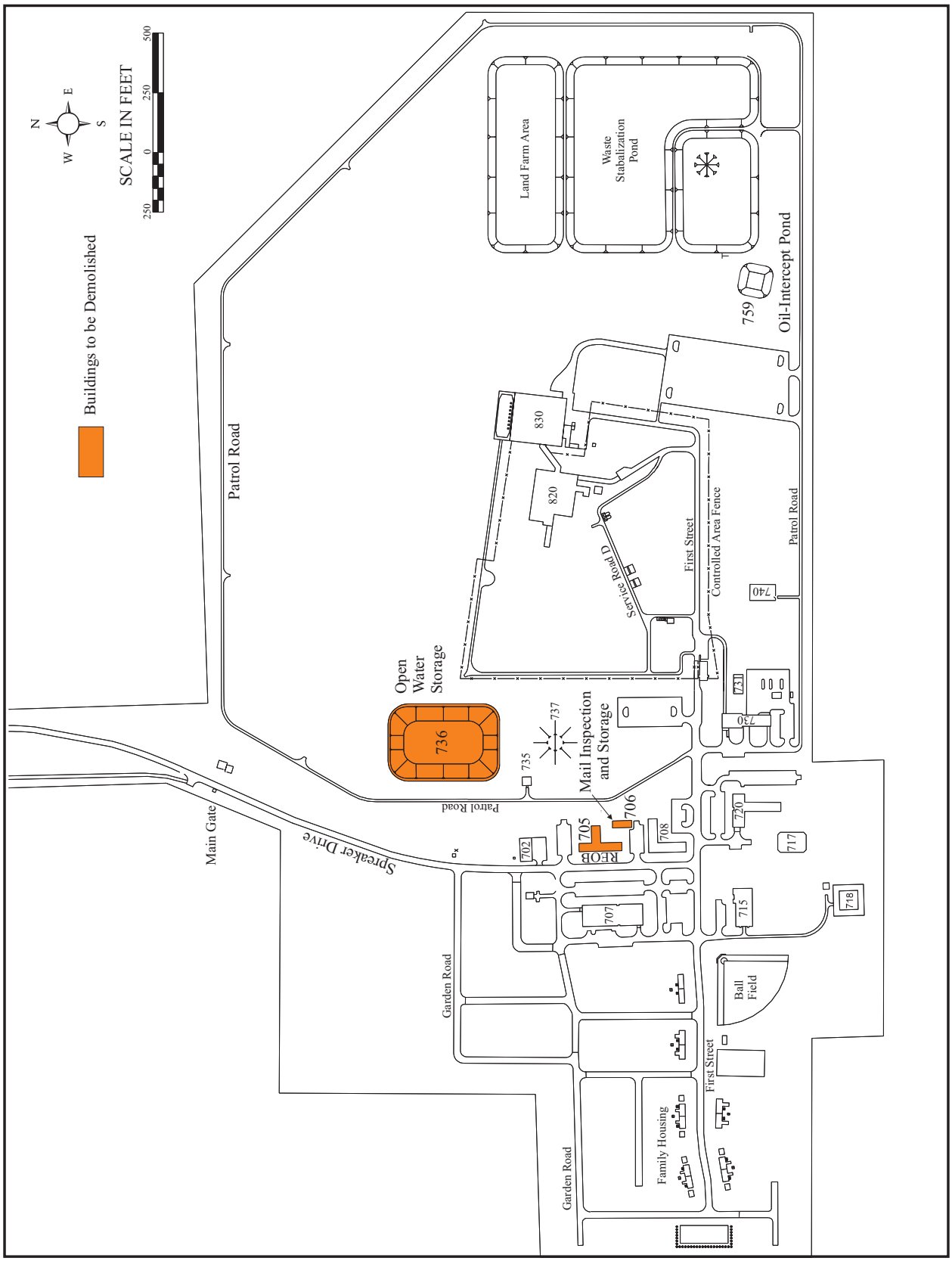

Figure 2.1-1 Location of Project Area on Cavalier Air Force Station

Figure 2.1-2. View of Water Reservoir

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CHAPTER 3

AFFECTED ENVIRONMENT

3. AFFECTED ENVIRONMENT

This chapter describes the environment at Cavalier AFS (as appropriate), providing baseline information to allow the evaluation of potential environmental impacts that could result from the Proposed Action, Reuse Alternative, and the No Action Alternative. As stated in 40 CFR Sec. 1508.14, the human environment includes natural and physical resources and the relationship of people to those resources. The environmental baseline resource areas described in this chapter were selected after identifying the potential issues and concerns of the Proposed Action, Reuse Alternative, and No Action Alternative. In accordance with 40 CFR Sec. 1502.15, the resource areas that would not be impacted are not described in this chapter, nor evaluated in Chapter 4. These resource areas are listed below, with a brief explanation of their omission from the analysis.

- **Biological Resources**. Demolishing Bldgs 705 and 706 or removing them for reuse would minimally impact vegetation. Bldgs 705 and 706 are sited on paved areas that would be planted in grass after demolition. Demolition of the reservoir would impact surrounding vegetation for the short-term but the entire reservoir area would be planted in grass after demolition is complete. The Proposed Action would result in a net gain in vegetation on the installation. There would be no significant impacts to wildlife or threatened or endangered species. For these reasons, biological resources will not be analyzed in the EA.
- **Transportation**. Transportation will not be analyzed since traffic volume on the installation is low and there is no appreciable congestion during peak traffic periods (USAF, 1999a). The additional worker vehicles and equipment associated with the demolition or reuse would not result in any noticeable change to the installation's entry gate or roads.
- **Utilities.** Impacts on current utilities will not be addressed do to the decrease in utility demands that would result from the demolition or reuse of the structures.
- **Lead-based paint.** Surveys to determine the presence of lead-based paint have been conducted on Cavalier AFS, however, Bldgs 705 and 706 have not been surveyed. These buildings will be surveyed for lead-based paint before they are demolished or sold for reuse. If lead-based paint is found, the encapsulation, removal, and disposal of the materials would be performed by trained personnel in accordance with all applicable Federal, state, local, and Air Force regulations. The quantities encountered, if any, would be small and the duration short; therefore, the removal process would not produce any significant impacts.
- **Underground storage tanks.** There are several underground storage tanks on Cavalier AFS containing diesel fuel and gasoline, but none are located closer than about 900 feet to the project sites (USAF, 1999a). Underground storage tanks would not be impacted by the Proposed Action; therefore, they will not be analyzed in this EA.
- **Polychlorinated biphenyls.** There are no polychlorinated biphenyls in or near the facilities to be demolished; therefore, they will not be analyzed in this EA.

- **Installation Restoration Program.** The closest Installation Restoration Program site is located about 400 feet away from the nearest project site and would not be impacted by the proposed demolition activities. Therefore, the Installation Restoration Program will not be further analyzed.
- **Hazardous materials and wastes.** Only small quantities of hazardous materials—mostly fuel—would be used during demolition and would be considered to be a part of normal operations. Potential impacts from a fuel or lubricant spill are assessed in Section 4.2 (groundwater), but are not analyzed separately.

The resource areas that may be impacted by the Alternatives and order of resource description is based on introducing the physical environment (air, geology, and water), the human environment (cultural, noise, and environmental justice), and the environmental framework (asbestos and solid waste) that manages the aforementioned resources and controlled materials and waste.

3.1 AIR RESOURCES

This section discusses the climate and meteorology of the area, air quality standards, and existing air pollutant sources.

3.1.1 Climate and Meteorology

The climate in northeastern North Dakota is typical of the Northern Great Plains with cold snowy winters, warm summer days and cool summer nights, and a variety of weather systems both in summer and winter. Hot humid days are rare in the summer, but cold waves and blizzards may be expected each winter. In a normal winter there are approximately 60 days with below zero temperatures. July is the warmest month with temperatures averaging 68^{o}F. The annual average precipitation is approximately 20 inches with 50 percent of the precipitation occurring during the months of June, July, and August. The average wind speeds are approximately 12 miles per hour throughout the year. Prevailing winds are from the north or northwest during November through May, and from the south or southwest from June to October.

3.1.2 Air Quality Standards

The National Ambient Air Quality Standards (NAAQS), established by the United States Environmental Protection Agency (USEPA) define the maximum allowable concentrations of pollutants that may be reached but not exceeded within a given time period. These standards were selected to protect human health with a reasonable margin of safety. Section 110 of the Clean Air Act (CAA) requires states to develop air pollution regulations and control strategies to ensure that state air quality meets the NAAQS established by USEPA. These ambient standards are established under Section 109 of the CAA, and they currently address six criteria pollutants. These pollutants are: carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), lead (Pb), particulate matter, and sulfur dioxide (SO_2). In addition to the six NAAQS, North Dakota also has standards for hydrogen sulfide (H_2S). Each state must submit these regulations and control strategies for approval and incorporation into the Federally enforceable State Implementation Plan (SIP). Exceeding

the concentration levels within a given time period is a violation, and constitutes a nonattainment of the pollutant standard.

North Dakota has adopted a more stringent set of standards, termed the North Dakota Ambient Air Quality Standards (NDAAQS). Emissions of air pollutants from operations in North Dakota are limited to the more restrictive Federal or state standard. Particulate matter has been further defined by size. There are standards for particulate matter smaller than 10 microns in diameter (PM_{10}) and smaller than 2.5 microns in diameter ($PM_{2.5}$). Implementation of the $PM_{2.5}$ standards are being reviewed by the USEPA. Table 3.1-1 presents the current NAAQS and the NDAAQS for the six criteria pollutants.

Table 3.1-1
National Ambient Air Quality Standards (NAAQS)
and North Dakota Ambient Air Quality Standards (NDAAQS)

Pollutant	*Averaging Time*	*NAAQS* μg/m³ (ppm)[a]		*NDAAQS* μg/m³ (ppm)[a]
		Primary[b]	*Secondary*[c]	
O_3	1 hr 8 hr[e]	235 (0.12) 157 (0.08)	Same Same	Same
CO	1 hr 8 hr	40,000 (35) 10,000 (9)	None None	Same Same
NO_2	AAM[d]	100 (0.053)	Same	Same
SO_2	1 hr 3 hr 24 hr AAM	None None 365 (0.14) 80 (0.03)	None 1,300 (0.5) None None	715 (0.273) None 260 (0.099) 60 (0.023)
PM_{10}	AAM 24 hour	50 150	Same Same	Same Same
$PM_{2.5}$ [e]	AAM 24 hr	65 15	Same Same	None None
Pb	¼ year	1.5	Same	Same
H2S	1-hour 24-hour 3 months AAM	None None None None	None None None None	280 (0.20) 140 (0.10) 28 (0.02) 14 (10)

[a] $\mu g/m^3$ — micrograms per cubic meter; ppm — parts per million

[b] National Primary Standards establish the level of air quality necessary to protect the public health from any known or anticipated adverse effects of a pollutant, allowing a margin of safety to protect sensitive members of the population.

[c] National Secondary Standards establish the level of air quality necessary to protect the public welfare by preventing injury to agricultural crops and livestock, deterioration of materials and property, and adverse impacts on the environment.

[d] AAM —Annual Arithmetic Mean.

[e] On June 5, 1998 EPA issued the final rule identifying areas where the one-hour national NAAQS for ozone is no longer applicable because there has been no current measured violation of the one-hour standard in such areas. The one-hour standard was revoked in the Colorado Springs area at that time.

PM_{10} is particulate matter equal to or less than 10 microns in diameter

$PM_{2.5}$ is particulate matter equal to or less than 2.5 microns in diameter

Source: 40 CFR 50, North Dakota Air Pollution Control Regulations – NDAC 33-15

Generally, criteria pollutants directly originate from mobile and stationary sources. Tropospheric O_3 is an exception, since it is rarely directly emitted from sources. Most O_3 forms as a result of volatile organic compounds (VOC) and nitrogen oxides (NO_x) reacting with sunlight. In 1997, an eight-hour average standard of 0.08 parts per million (ppm) was adopted to replace a one-hour standard. The one-hour standard for ozone of 0.12 ppm was retained as a transition to the new eight-hour standard for those areas that were in nonattainment. On June 5, 1998, the USEPA issued the final rule identifying areas where the one-hour NAAQS for ozone is no longer applicable because there had been no violation of the one-hour standard in such areas in the last three years. While the eight-hour standard was under review by the U.S. Supreme Court, the one-hour standard was reinstated.

All areas of the country are classified as attainment, nonattainment, or unclassifiable. Areas which meet the national primary and secondary ambient air quality standards are classified as attainment. Any area that does not meet (or that contributes to ambient air quality in a nearby area that does not meet) the national primary or secondary ambient air quality standard for any criteria pollutant is designated as nonattainment.

The North Dakota Department of Health (NDDH) conducted an Air Quality Monitoring Survey for calendar year 1997 (NDDH, 1998). The NDDH operated 11 ambient and 2 special purpose air quality monitoring sites and industry operated 10 source-specific air quality monitoring sites. The data from these sites indicated that the quality of the ambient air in North Dakota is generally good. The entire North Dakota Air Quality Control Region (including Pembina County) is in attainment status for all criteria pollutants.

Prevention of significant deterioration (PSD) regulations (40 CFR Section 52.21) define air quality levels that cannot be exceeded by major stationary emission sources in specified geographic areas. Major stationary sources are usually sources that emit more than 100 tons per year (tpy) of a specific pollutant. PSD regulations establish limits on the amounts of SO_2 and total suspended particles (TSP) that may be emitted above a premeasured amount in each of the three class areas. Class I areas are pristine areas, and include national parks and wilderness areas. All other areas in the United States are Class II areas, where moderate, well-controlled industrial growth could be permitted. There are no Class I areas located in the vicinity of Cavalier AFS. Cavalier AFS is located in a PSD Class II area. Net emissions would be significant at the following thresholds: CO, 100 tpy; NO_x, sulfur oxides (So_x), or VOCs, 40 tpy; or Pb, 0.6 tpy (40 CFR 52.21).

3.1.3 Air Pollutant Sources

Air pollutants include the six criteria pollutants discussed previously. Particulate matter (PM_{10} and $PM_{2.5}$) is generated during ground disturbing activities and during combustion. The principal source of CO and SO_2 is combustion. The precursors of O_3 (VOC and NO_2) are also primarily emitted from combustion. Hazardous air pollutants (HAP) include a wide range of materials or chemicals that are toxic or potentially harmful to human health. While HAPs are found in numerous products and used in many processes, few types and small amounts of HAPs are generated during internal combustion processes or earth-moving activities. An Air Quality Monitoring Report (NDDH, 1998) did not identify any reportable levels of HAPs for Cavalier AFS.

There were no NO_2, O_3, or PM exceedances of either the state or Federal ambient air quality standards measured during the year. Cavalier AFS conducted an installation-wide Air Emissions Inventory for calendar years 1998, 2000, and 2001 and modified some of the sources in 2000, 2001, and 2002, all of which were approved by the State (Kotchman, 2003). The installation-wide criteria pollutants from stationary sources, HAPs, and potential to emit for criteria pollutants and HAPs are shown in Table 3.1-2. The installation has a renewed Title V permit issued by the NDDH valid until January 22, 2007. Emissions in 1998 and 2000 were below limits in the permit. Cavalier AFS is a major stationary source, as emissions of criteria pollutants are above 100 tpy and the potential to emit for any criteria pollutant is more than 250 tpy.

Table 3.1-2
Actual Installation-Wide 2001 Air Pollutant Emissions at Cavalier AFS
(values in tons per year)

Emissions	*PM_{10}*	*NO_x*	*SO_x*	*CO*	*VOC*	*Total HAP*
Actual Emissions	18.77	194.45	2.41	77.82	14.34	1.09
Potential to Emit	154.86	1,115.82	20.27	477.32	84.46	9.76

Sources: USAF, 2002

3.2 GEOLOGICAL RESOURCES

Geological resources discussed in this section include physical features of the earth such as geology (surface and subsurface features), topography, and soils within the vicinity of Bldgs 705 and 706 and the water reservoir.

3.2.1 Geology and Topography

Cavalier AFS is situated within the Western Lake Section of the Central Lowlands physiographic province and in the Red River Valley district. The Red River Valley is bordered by the Pembina Escarpment that more or less trends north-south approximately 35 miles west of the Minnesota-North Dakota State Line. Its physical subdivision is within the eastern margin of North Dakota forming a strip 35 to 50 miles wide trending north-south. The valley is a flat, nearly featureless lake plain that has undergone very little erosion (USAF, 2000a). The Pembina Escarpment rises abruptly 500 to 700 feet above the valley bottom forming (in conjunction with the Pembina delta) the Pembina Mountains. Elevations on the installation range from 1,130 feet above mean sea level in the eastern portion of the base to 1,180 feet in the western part. The regional gradient is to the northeast, away from the Pembina Escarpment, which lies about one mile to the west of the installation (USAF, 2000b; USGS, 1964).

The surface geology of the region is strongly influenced by glacial Lake Agassiz that formed when the north-flowing Red River was dammed by the retreating glacier in the Red River Valley. Cavalier AFS is located within a region of sand and gravel deposits, part of the Coleharbor Group, that were formed in nearshore and offshore environments of Lake Agassiz (USGS, 1975). Wave action was the dominant factor producing the landforms of this area. Sand and gravel were reworked in this near-shore area and were deposited as vast beaches. This area is gentle and rolling with a nearly flat to gently undulating surface

(USAF, 2000c). An area of silt and clay deposits (about one mile from west to east) are located about one mile east of Cavalier AFS. An extensive area of sand and gravel deposits is located about 2.5 miles east of Cavalier AFS. In western Pembina County, the Niobrara Formation underlies the surficial layers. This formation is comprised of shale and marlstone that is massive and jointed in the upper layers and the lower layers are fissile (tending to split along well-developed planes). The Carlile Formation, comprised of soft shale, which slumps easily, underlies the Niobrara Formation. The Greenhorn and Belle Fourche Formations (both composed of shale) and the Dakota Group (with shale and sandstone) underlie the Carlile Formation. The depth to the Dakota Group varies from about 175 to 300 feet below the surface. Scattered lenses of limestone are present in this area, generally at depths of 120 to 300 feet (USGS, 1975).

Four test bores were drilled at Cavalier AFS in August 1968 to determine the properties of geologic layers at the installation. Varying layers of sand and silty sand grading to gravelly sand were noted at each site. In the two holes closest to the reservoir (P68-16 and P68-19), Niobrara shale underlied these sediments. Carlile Shale underlies sediments at the other test holes. The stratigraphy of tests holes P68-16 and P68-19, located about 985 feet and 1,205 feet, respectively, east of the reservoir is shown in Table 3.2-1. The depth to bedrock is nearly 13 feet (USAF, 1999b).

Table 3.2-1
Stratigraphy of Test Holes P68-16 and P68-19
Cavalier AFS

Bore Hole	**P68-16**	**P68-19**
Depths in Feet	0.0-0.6 Silty Sand	0.0-2.3 Clayey Sand
	0.6-5.6 Clayey Sand	2.3-3.4 Silty Sand
	5.6-8.2 Sand	3.4-4.8 Clayey
	8.2-9.4 Silty Sand	Gravelly Sand
	9.4-10.3 Silty Gravel	4.8-5.3 Silty Sand
	10.3-12.2 Silty Sand	5.3-6.9 Silty Sandy Gravelly Sand
	12.2-12.9 Clayey Gravelly Sand	6.9-12.7 Silty Sand
	Bedrock	**Bedrock**
	12.9 to 14.6 Niobrara Shale	12.7 to 19.6 ft Niobrara Shale
	14.6 ft to 116.5 Carlile Shale	19.6 ft to 100 ft Carlile Shale
	116.5 ft to 150 Limestone	
Depth to Groundwater	7.6 feet	5.3 feet
Depth to Bedrock	12.9 feet	12.7 feet
Date	*16-20 August 1968*	*21-23 August 1968*
Source: USAF, 1999b		

There are no major faults in northeastern North Dakota and the hazard of earthquake damage is low (USGS, 2003). The entire state is included within Seismic Zone 0 on the seismic probability map of the United States. Zone 0 is an area where earthquakes do not occur, but major distant earthquakes could produce slight damage. There are no specific seismic design requirements for Zone 0 (USAF, 1992).

3.2.2 Soils

Soils on Cavalier AFS consist of three soil series – Brantford loam, Binford sandy loam, and Vang loam. These series are well drained and formed in sand, silt, and gravel (USDA, 1977). The Brantford loam occurs only along an unnamed intermittent tributary of Tongue River and is not in the area potentially impacted by the Proposed Action. Properties of Binford and Vang soils are shown in Table 3.2-2. Soils in the proposed project areas for Bldgs 705 and 706 are Vang loam with one to three percent slopes. This soil consists of loam to a depth of 26 inches, and gravel and coarse sand to a depth of 60 inches. Shaly gravel and sand-sized shale particles underlie the soil. Permeability is moderate to rapid. Runoff is slow and the hazard of wind erosion is slight. Soils in the proposed project area for the water storage reservoir are Binford sandy loam with one to three percent slopes. This soil consists of sandy loam to a depth of 12 inches and gravelly sand to a depth of 60 inches. This soil is underlain by sand and gravel. Permeability is moderately rapid to rapid. Runoff is very slow and the hazard of wind erosion is high. The Binford sandy loam is difficult to revegetate due to droughty conditions (USDA, 1977).

None of the soils on Cavalier AFS are listed as hydric soils (a potential indicator of wetlands). The Binford and Vang soils are both susceptible to piping (the formation of subsurface tunnels by water erosion which can cause subsidence of the soil and further erosion).

Table 3.2-2
Soil Properties in the Project Area

Soil Series	*Wind Erosion*	*Shrink-Swell*[1]	*Excavation*	*Piping*[2]	*Compaction*
Binford	high	low	severe – cutbanks cave	susceptible	Fair-good
Vang	slight	low	severe – cutbanks cave	susceptible	Poor-good

[1] Shrink-swell is the change in volume in a soil when soil moisture changes markedly (the tendency to swell when wet and shrink when dry).

[2] A major consideration for soil used as fill is the tendency for piping (formation of subsurface tunnels or pipe-like cavities by water moving through soil), which can cause severe erosion.

Sources: USDA, 1977

3.3 WATER RESOURCES

Water resources include surface and groundwater sources, quantity and quality. The hydrologic cycle results in the transport of water into various media such as the air, the ground surface, and subsurface. Natural and human-induced factors determine the quality of water resources. Water resources discussed in this document include groundwater and surface water. There are no floodplains on the installation.

3.3.1 Groundwater

Two types of aquifers provide groundwater in northeastern North Dakota—bedrock aquifers and glacial drift aquifers. There are three major aquifers located in the vicinity of Cavalier AFS. The Dakota Aquifer is the major bedrock aquifer while the Icelandic Aquifer is the largest glacial-drift aquifer. The Pembina Delta Aquifer is underlain by

shale bedrock and by glacial till and thick deposits of lake clay and silt. Small aquifers within the Niobrara Formation and in Lake Agassiz beach deposits are also a source of groundwater.

The Dakota Aquifer underlies all of North Dakota, except parts of the Red River Valley. The western half of Pembina County is underlain by the Dakota Aquifer. This aquifer is located in the Dakota Group (shale and sandstone), generally from about 175 feet to 300 feet below the surface in western Pembina County, and is composed of quartzose, sandstone, and shale. The Dakota Aquifer is overlain and confined by the Greenhorn and Belle Fourche Formations (both composed of shale). Recharge of the Dakota Aquifer is to the west of the installation. Water from the Dakota Aquifer is generally not used because it is moderately saline, with greater than 5,000 milligrams per liter (mg/L) total dissolved solids (TDS), primarily sodium chloride and iron (USGS, 1977).

The Niobrara Aquifer yields small to moderately large quantities of water in large interconnected joints and fractures in shale. Well depths in this aquifer in the vicinity of Cavalier AFS range from 35 to 45 feet below the surface (NDSWC, 2003). Water quality is generally good, with TDS ranging from 390 to 2,500 mg/L, primarily sodium bicarbonate (USGS, 1977). Recharge is generally from overlying glacial drift aquifers.

The Carlile Formation is a potential source of limited amounts of water. The water is highly mineralized with poor water quality.

Two shallow glacial drift aquifers are near Cavalier AFS – the Icelandic Aquifer and the Pembina Delta Aquifer. The Icelandic Aquifer is more than 20 miles long, as much as 9 miles wide, and underlies about 82 square miles. The aquifer consists mostly of very fine to medium sand and gravel interbedded with silt and clay. The aquifer is unconfined at the top and underlain by clay but generally becomes finer grained with increasing depth from west to east. To the east of Cavalier AFS, the aquifer is saturated from 8 to 35 feet below the surface on average, and is approximately 15 to 30 feet thick. This aquifer has a maximum thickness of 70 feet. Recharge is mainly from precipitation that is received on the surface of the aquifer. Water from this aquifer is predominantly very hard (TDS is about 250 mg/L), fresh, and a calcium magnesium bicarbonate type that is acceptable for most domestic and public uses (USGS, 1977). The Icelandic Aquifer is about three miles east of Cavalier AFS and is a source of water for domestic use and irrigation. Groundwater movement through the aquifer is generally from west to east.

The Pembina Delta Aquifer is about 71 square miles in area and consists of clay, silt, sand, and gravel. To the north of Cavalier AFS, the aquifer is saturated from four to 31 feet below the surface on average, and is approximately 27 feet thick. Recharge to the Pembina Delta Aquifer is mainly from precipitation that is received in the immediate area; however, precipitation must percolate through several tens of feet of sediment before reaching the water table in much of the area. Groundwater in the Pembina Delta Aquifer is considered very hard (TDS is about 340 mg/L), with a high dissolved calcium and magnesium content. Iron in the groundwater often exceeds drinking water standards. The Pembina Delta Aquifer is tapped in the Cavalier region for livestock, irrigation, and some domestic use (USGS, 1977). This aquifer is about 1.5 miles north of Cavalier AFS. Groundwater movement through the aquifer is generally from west to east.

Lake Agassiz beach deposits, in long, narrow deposits of sand and gravel, are a source of water in limited areas. These aquifers are usually about 10 feet thick and water quality is generally good. Recharge is from precipitation. The town of Mountain, about 2.5 miles southeast of Cavalier AFS, obtains their municipal water supply from two wells drilled into this aquifer. The wells are about 23 feet deep.

A borehole log from a well drilled about one half mile west of Cavalier AFS indicated a water depth of 13 feet (USGS, 1973), in an unconfined lake deposit aquifer. A borehole near the site of the PAR Building (Bldg 830) completed for a Geothermal Feasibility Study indicated a water depth of 7.6 feet (USAF, 1999b). This well was drilled into an unconfined aquifer in sand, overlain by silty sand and clayey sand.

Cavalier AFS purchases water from the North Valley Water Association. The water is derived from wells in the Icelandic Aquifer, about 8 miles northeast of Cavalier AFS.

Overall, water quality in the shallow glacial drift and beach deposit aquifers is good. The water is classified as very hard (greater than 180 mg/L calcium and magnesium). Typically, the pH (alkalinity/acidity factor) ranges from 7.6 to 8.1, which is considered alkaline (USGS, 1973).

3.3.2 Surface Water

Northeastern North Dakota lies in the Central Lowlands physiographic region, which is primarily drained by the Red River of the North. This river drains 48,000 square miles of the United States, including 29,900 square miles of North Dakota. The Red River of the North forms in southeastern North Dakota, where the Otter Tail and Bois de Sioux Rivers combine. The primary tributaries near Cavalier AFS are the Pembina, Park, and Tongue Rivers.

The tributaries to the Red River of the North drain a large area. The Park River starts in Cavalier County and drains 1,010 square miles. Its waters are used for stock watering, municipal supply, recreation, and irrigation. The Pembina River starts in the Turtle Mountains and enters the Red River of the North at Pembina. It drains 1,960 miles in North Dakota and is used for stock watering, municipal supply, and recreation. The Tongue River is located about one-half mile north of Cavalier AFS and flows northeast, draining into the Pembina River. Although 59 percent of rivers in the Red River Basin fully supports aquatic life, the Tongue River only partially supports aquatic life. This is primarily due to siltation from soil erosion (NDDH, 2000). Runoff from much of Cavalier AFS flows south, off of the installation, into Willow Creek, a tributary of the Park River, which travels southeast from the installation and empties into the Red River. Some runoff from the northern and western parts of the installation drains into a small intermittent stream (heading about 250 feet northwest of the reservoir) (see Figure 3.3-1) which flows north into the Tongue River (USAF, 2000d). Figure 1.4-1 shows some of the major tributaries in the area.

All discharge from Cavalier AFS is governed under a National Pollutant Discharge Elimination System (NPDES) General Permit for Discharge (Permit Number NDR03-0000). This permit authorizes discharge of stormwater associated with construction activities at Cavalier AFS, in accordance with the conditions specified in the permit.

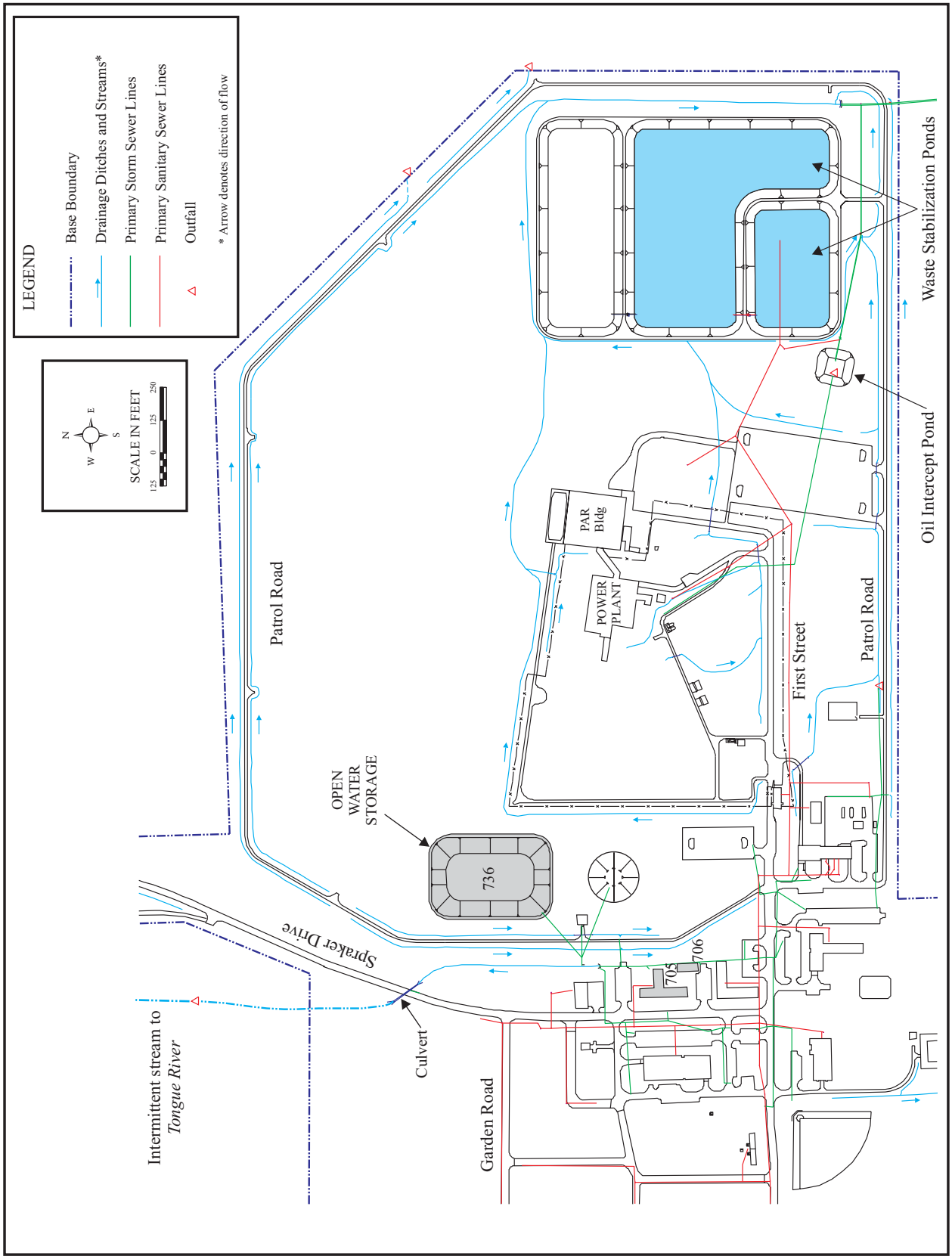

Figure 3.3-1. Location of Drainage and Sewer Lines

Projects between 1 and 5 acres would need a Phase II NPDES permit, while projects greater than 5 acres would require a Phase I permit. As part of this permit, a stormwater pollution prevention plan for construction projects must be prepared 30 days prior to the start of construction. This plan requires specifying details of best management practices to be used to prevent discharge of sediment to stormwater sewer systems or drainageways (USAF, 2000d).

3.4 CULTURAL RESOURCES

Cultural resources are archaeological, historical, and Native American items, places, or events considered important to a culture, community, tradition, religion, or science. Archaeological and historic resources are locations where human activity measurably altered the earth or left deposits of physical or biological remains. Prehistoric examples include arrowheads, rock scatterings, and village remains, whereas historic resources generally include campsites, roads, fences, homesteads, trails, and battlegrounds. Architectural examples of historic resources include bridges, buildings, canals, and other structures of historic or aesthetic value. Native American resources can include tribal burial grounds, habitations, religious ceremonial areas or instruments, or anything considered essential for the persistence of their traditional culture.

The Air Force conducted a cultural resources survey of Cavalier AFS in 1991 (USAF, 1999a). The survey did not identify any archaeological resources and concluded that disturbance from the construction of Cavalier AFS removed any possibility of finding historic or archaeological remains on the installation.

In 1970, construction at Cavalier AFS began as a site for the U.S. Army Safeguard Missile Defense Program. The system became operational five years later. The original system was composed of a Perimeter Acquisition Radar (PAR), the Missile Site Radar, and four Remote Sprint Launch sites. The PAR (Bldg 830) is the only site located on Cavalier AFS. The Missile Site Radar is located in Nekoma. These six sites were designated the Stanley R. Mickelsen Safeguard Complex (SRMSC), protecting the northern United States and Canada from the "Cold War" Intercontinental Ballistic Missile threat. In 1976, with the ratification of the 1972 Anti-Ballistic Missile (ABM) Treaty, all components of the SRMSC, with the exception of the PAR building, were deactivated. The SRMSC was the only operational ABM system ever deployed in the free world and is recognized as a significant influence in the negotiations of the ABM and SALT treaties with the Soviet Union. The PAR was designated the Concrete Missile Early Warning System in 1977. Since December 1983, the facility has been called Cavalier Air Force Station.

As a result of the important part that the SRMSC played in the history of the Cold War, and the unique technological and architectural features it includes, the U.S. Department of the Interior, National Park Service, determined the surviving portions of the complex are eligible for inclusion on the National Register of Historic Places (DOI, 1998; U.S. Army, 2003). The Army has prepared a Historic Preservation Plan and a Historic American Building Survey (HABS)/Historic American Engineering Record (HAER) for the SRMSC. The 1998 determination of eligibility notification completed for the SRMSC determined that Bldg 706 (the first structure on Cavalier AFS) had no historical significance (DOI, 1998). The U.S Department of Interior, National Park Service, did determine that several

facilities/structures on Cavalier AFS were eligible for inclusion on the National Register of Historic Places. Facility 705 and Structure 736 (water reservoir) were determined to be historic in nature because of the role they played in the cold war and any work on or in close proximity to these facilities must be considered for impacts on the historic aspects of the structures (U.S. Army, 2003).

3.5 NOISE

Noise is defined as any unwanted sound that interferes with normal activities or in some way reduces the quality of the environment. Ambient noise levels vary greatly in magnitude and character from one location to another, depending on the normal activities conducted in the area.

Community response to noise is not based on a single event, but on a series of events over the day. Factors that have been found to affect the subjective assessment of the daily noise environment include the noise levels of individual events, the number of events per day, and the time of day at which the events occur. Most environmental descriptors of noise are based on these three factors, although they may differ considerably in the manner in which the factors are taken into account. Various types of noise measures are used to describe impacts on an existing environment. For construction or demolition projects, these include the decibel and the equivalent sound level. These measures and their application to noise environments are discussed below.

A decibel (dB) is the physical unit commonly used to describe sound levels. Sound measurement is further refined by using an "A-weighted" decibel (dBA) scale that emphasizes the audio frequency response curve audible to the human ear. Thus, the dBA measurement more closely describes how a person perceives sound. For example, typical noise levels include: a quiet urban nighttime (40 dBA), an air conditioner operating 100 feet away (55 dBA), and a heavy truck moving 50 feet away (85 dBA). Table 3.5-1 shows noise levels for various types of construction equipment.

Table 3.5-1
Approximate Sound Levels (dBA) of Construction Equipment

	Sound Levels (dBA) at Various Distances (ft)					
Averaging Time	**50**	**100**	**200**	**400**	**800**	**1,600**
8 hours	88.5	82.5	76.5	70.5	64.5	58.5
24 hours	82.0	76.0	70.0	64.0	58.0	52.0

Leq for 8 and 24 hours, using an average source of 90 dB at 50 feet from a typical mix of construction equipment, generating a maximum noise level 70 percent of an eight hour period. The 24-hour average is averaged over one year, assuming 250 workdays.

Noise attenuation of 6 dBA for each doubling of distance assumes flat terrain with no trees or buildings. Trees and buildings would increase the attenuation, reducing noise levels at various distances.

Assumes a background noise level of 45 dBA for a typical rural area (WHO, 1995)

Equipment noise is normally measured over an eight-hour time period, using the equivalent sound level (L_{eq}). L_{eq} is calculated using the dBA levels of noise events averaged over time, taking into account the usage factor of various types of equipment.

There are two basic considerations for protecting the community from increased noise from short-term sources. To protect human health, noise levels must not exceed limits identified with potential loss of hearing. An L_{eq} of 73 dB sustained over 8 hours for 250 days or more per year can cause hearing loss to a general population over a prolonged time period (about 40 years) (USEPA, 1974). The other consideration for protecting the public is noise interference with activity, or annoyance. This depends upon the setting in which the increased noise takes place, for both indoor and outdoor activities. Thresholds for various uses vary from 45 L_{eq} (24 hours) within hospitals, educational facilities, residences, and other locations based on a quiet use to 70 L_{eq} (24 hours) for outdoor exposure in recreational and industrial areas (USEPA, 1974). Communities that typically experience higher noise levels tolerate higher increases in noise (typically 5 dB more without complaints).

Noise generated near the ground generally attenuates 6 dB for each doubling of distance from a noise source; trees and terrain would further increase attenuation. Noise generated further above ground (above 50 ft) generally attenuates about 2 dB for every doubling of distance.

Noise levels on Cavalier AFS result primarily from traffic. Agricultural lands surround the base. There are no sensitive receptors (hospital, chapel, or school) on Cavalier AFS, but a family housing area is situated in the southwest part of the installation. The family housing area is the only sensitive receptor at Cavalier AFS. Sensitive receptors for noise are defined as the occupants of any facility where a state of quietness is a basis for use, where excessive noise interferes with the normal use of the facility.

3.6 ENVIRONMENTAL JUSTICE

Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, was signed by the President on February 11, 1994. This EO requires that each federal agency identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations. In order to evaluate these potential effects, demographic data on minority and low-income populations are provided in this section.

The terms "low-income" and "minority" are defined according to guidance published by the Air Force Center for Environmental Excellence (AFCEE). Under this guidance, "low-income" is defined as persons below the poverty level. The poverty threshold, which is a function of family size and is adjusted over time to account for inflation, was designated by the federal government as $17,524 for a family of one adult and three children in 2000. "Minority" means persons designated in census data as Black (African-American); American Indian, Eskimo, or Aleut (Native American); Asian or Pacific Islander (now two separate designations in the 2000 Census); Other; or of Hispanic origin (AFCEE, 1997). The 1997 AFCEE Guidance did not address the new census category, "Two or more Races;" for this analysis, that category is also considered as a minority. According to the United States Bureau of Census (USBC) definition (USBC, 2001a), the Hispanic origin designation is separate from the ethnic (racial) designation, as "people who identify their origin as Spanish, Hispanic, or Latino may be of any race." Within this document, to

avoid confusion and eliminate double-counting, the Hispanic population is differentiated from ethnic (racial) minority populations. The environmental justice region of influence (ROI) is defined for this EA as a portion of Pembina County within one mile of Cavalier AFS.

Environmental Justice also takes into consideration EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, which was signed by the President on April 21, 1997. This EO requires that each Federal agency identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on children, who are more at risk because of developing body systems, comparatively higher consumption-to-weight ratios, behaviors that may expose them to more risks and hazards than adults, and less ability than adults to protect themselves from harm.

This section describes the minority and low-income characteristics of the project area and Pembina County. The descriptions are based on data from the 2000 *Census of Population and Housing*. Table 3.6-1 summarizes the proportions of ethnic, Hispanic, and low-income populations for the vicinity of Cavalier AFS and Pembina County.

The 2000 Census found that the population of Pembina County was 95.5 percent White. Notable other categories include American Indian (1.4 percent), while Other and Two or More Races accounted for 2.7 percent of the total. Hispanics comprise 3.1 percent of the county population.

Table 3.6-1
Census 2000 Characteristics:
Population Segment as a Percentage of the Total Population

	Census blocks in affected area[1]	Pembina County	ND
White (a)	100.0%	95.5%	92.4%
Black or African American (a)	0.0%	0.2%	0.6%
American Indian and Alaska Native (a)	0.0%	1.4%	4.9%
Asian (a)	0.0%	0.0%	0.6%
Native Hawaiian and Other Pacific Islander (a)	0.0%	0.0%	0.0%
Some other race (a)	0.0%	1.3%	0.4%
Two or more races	0.0%	1.4%	1.2%
Hispanic Origin (can be any race)	0.0%	3.1%	1.2%
Children (age 17 or less)	21.1%	24.9%	25.0%
Below poverty level[2]	7.0%	9.2%	11.9%

(a) Includes persons reporting only one race. Population by race is from Census 2000 Summary File 1.

[1] Census blocks off-base within 1 mile.

[2] Values for the percent of persons below poverty level are from Census 2000 Summary File 3.

Sources: USBC, 2002; USBC, 2001b.

North Dakota proportions are somewhat similar, but with a larger proportion of American Indians (4.9 percent). The State's Hispanic population accounts for about 1.2 percent of the total. In contrast, the U.S. population is approximately 25 percent minority, with Hispanics

(12.5 percent) as the largest minority group, and Blacks representing 12.3 percent of total population. Less than 10 percent of the Pembina County population was below the poverty level, while about 11 percent of the state's population and 13 percent of the U.S. population was in this category. The 1999 per capita income for Pembina County was $18,692, which represents nearly 87 percent of the U.S. per capita income and 105 percent of North Dakota's per capita income (USBC, 2002).

Cavalier AFS is located in a sparsely populated rural area. There are 19 off-base residents in census blocks within one mile of the project area. This population includes 19 whites. There are no Hispanics, and there are four children within this area (USBC, 2002; USBC, 2001a). The closest Census Designated Place is the town of Mountain, three miles to the southeast. The population of Mountain is 133, composed of 132 whites (99.2 percent) and 1 American Indian (0.8 percent). There are no urban areas in Pembina County, and the closest urban area (a population of 2,500 or more) is Grafton, about 30 miles southeast of Cavalier AFS.

3.7 ASBESTOS

Asbestos is a regulated substance because it is a known carcinogen and a cause of asbestosis (a lung disease). Asbestos is a designated HAP under the National Emission Standards for Hazardous Air Pollutants (NESHAP) of the CAA. USEPA issues regulations to insure compliance with the CAA, and has delegated compliance with the CAA to the State of North Dakota. North Dakota has issued regulations contained in the Air Pollution Control Rules. The regulations are enforced by the NDDH Air Quality Division. The *Occupational Safety and Health Act Asbestos Standard* (*29 CFR 1926.58)* also provides worker protection for employees who work around or remediate asbestos-containing material (ACM). Friable ACM, which can be pre-existing or generated during a demolition or renovation activity, refers to any material containing more than one percent asbestos that can be crumbled, pulverized, or reduced to powder when dry, by using hand pressure or similar mechanical pressure. A full asbestos survey of Bldg 705 has been completed. It contains approximately 9,000 square feet of floor tile, and preliminary reports from the asbestos survey indicate minimal amounts of ACM joint compound in the facility. In Bldg 706, an elbow on top of the boiler room water heater contains seven percent chrysotile asbestos insulation (Kotchman, 2003).

When asbestos poses a health danger from the release of airborne fibers (because it is in a friable state), Air Force policy (*AFI 32-1052, Facility Asbestos Management*) is to remove or isolate it. Federal and state regulations require that all affected parts of a facility being renovated or demolished must be inspected by a state-certified inspector for the presence of ACM prior to beginning a renovation or demolition project. All regulated ACM that will be disturbed as part of a renovation or demolition must be properly removed by state-certified individuals and properly disposed of in an approved landfill. Regulated ACM includes all friable ACM, as well as nonfriable ACM that would be made friable during the project. Under North Dakota Administrative Code 33-15-13-02, regulated ACM is defined as "friable asbestos material, Category I nonfriable asbestos-containing material that has become friable, or has been subjected to sanding, grinding, cutting or abrading, Category II nonfriable asbestos-containing material that has a high probability of becoming or has become crumbled, pulverized, or reduced to powder by the forces expected to act on

the material in the course of demolition or renovation operations." A Notification of Demolition and Renovation Form must be submitted to the NDDH ten days prior to beginning any demolition activity, whether or not asbestos is present, and for a renovation activity, it must be submitted ten days prior to beginning the removal if more than 160 square feet of asbestos-containing surfacing material or more than 260 linear feet of asbestos-containing thermal system insulation (TSI) will be disturbed (NDDH, 2001).

Non-regulated Category I non-friable ACM includes such items as floor tile and joint compound. These would only have to be removed before demolition if the concrete to which the materials are attached was to be recycled.

3.8 SOLID WASTE

Solid wastes include all waste materials that are neither hazardous nor toxic, and which are normally disposed of by landfilling or incineration, or are recycled or recovered. The management of solid (non-hazardous) waste on Cavalier AFS includes the collection and disposal of solid wastes and recyclable material by contract. Recyclable items include glass, paper, cardboard, metal, and plastics. There are no active landfills on the installation; solid waste from the installation is taken to the city of Grand Forks landfill. The installation disposes of approximately six cubic yards of solid waste per month.

Inert wastes are those types of bulky wastes that normally do not pose significant hazards of environmental degradation. Inert waste will not generally contaminate water or form a contaminated lechate and does not serve as food for vectors. The North Dakota Department of Health, Division of Waste Management, describes inert waste as construction and demolition material such as metal, wood, bricks, masonry and cement concrete; asphalt concrete; tires; metal; tree branches; bottom ash from coal and fired boilers; and waste coal fines from air pollution control equipment. North Dakota defines asphalt as inert solid waste (North Dakota Administrative Code (NDAC) 33-20-01.1-03). The asphalt liner of the reservoir could be disposed of in an inert solid waste landfill, in accordance with NDAC 33-20-05.1.

CHAPTER 4

ENVIRONMENTAL CONSEQUENCES

4. ENVIRONMENTAL CONSEQUENCES

This chapter discusses the potential for significant impacts to the human environment as a result of implementing the Proposed Action, Reuse Alternative, or No Action Alternative. As defined in 40 CFR 1508.14, the human environment is interpreted to include natural and physical resources, and the relationship of people with those resources. Accordingly, this analysis has focused on identifying types of impacts and estimating their potential significance. Impacts can be direct (caused by the action and occurring at the same time and place) or indirect (caused by the action but occurring later in time or are farther removed in distance, but are still reasonably foreseeable), as defined by 40 CFR 1508.8.

The concept of "significance" used in this assessment includes consideration of both the context and the intensity or severity of the impact, as defined by 40 CFR 1508.27. Severity of an impact could be based on the magnitude of change, the likelihood of change, the potential for violation of laws or regulations, the context of the impact (both spatial and temporal), and the resilience of the resource. Significant impacts are effects that are most substantial and should receive the greatest attention in decision making. Impacts that are not significant include those that result in little or no effect to the existing environment or that cannot be easily detected. No impact is specified in cases in which a resource would not be affected because certain resource elements (e.g., floodplains, sensitive noise receptors, or low-income or minority populations) are not present in the project area. No impact could also occur under the No Action Alternative if there were no changes to the existing environment. Improved conditions are not characterized as to their level of significance. If a resource would be measurably improved by a proposed activity, a beneficial impact was noted.

This chapter is organized by resource element in the same order as introduced in Chapter 3. Each resource section provides a discussion of the environmental impacts to that resource. Also included is a description of the analysis methods and the potential impacts of the Proposed Action, Reuse Alternative, and No Action Alternative, including suggested best management practices, if applicable. Any necessary mitigation measures are also presented. In accordance with 40 CFR 1502.16, this chapter concludes with a discussion of the compatibility of the Proposed Action with objectives of Federal, state, and local land use plans, policies, and controls, an evaluation of the relationships between short-term uses of the environment and long-term productivity, cumulative impacts, and irreversible and irretrievable commitments of resources.

4.1. AIR RESOURCES

The Proposed Action would have short-term, but not significant, impacts on air quality generated by heavy equipment and earth-moving activities during demolition of the water storage reservoir and Bldgs 705 and 706. Under the Reuse Alternative, air quality impacts would be less, since less demolition is involved. The No Action Alternative would not change air quality levels at Cavalier AFS.

4.1.1. Analysis Methods

The analysis was based on a review of existing air quality in the region, information on Cavalier AFS air emission sources, projections of emissions from the proposed demolition

activities, a review of Federal regulations, and the use of air emission factors from the USEPA or similar sources.

4.1.2. Potential Impacts of the Proposed Action

There would be increased emissions from the use of heavy equipment and worker vehicles during the demolition of the Water Storage Reservoir and Bldgs 705 and 706. The method of demolition for Bldgs 705 and 706 would likely be mechanical (wrecking ball). Demolition of the buildings would generate PM_{10}, from equipment operation and from trips to dispose of rubble. Demolition of the reservoir (which extends to a depth of 10 feet below the surrounding grade) would be accomplished by removing the 3-inch layer of asphalt and then pushing the earthen and aggregate berms into the area below ground. About 16,500 cubic yards of fill would be transported to Cavalier AFS and placed in the hole to restore the site level with the surrounding area. Heavy construction equipment would generate emissions, with CO, NO_x, and VOCs as the main constituents of exhaust, and earth-moving operations would generate fugitive dust (measured as PM_{10}).

Although construction-related emissions are generally exempt from Federal regulatory review, USEPA still requires that such activities not exceed the NAAQS. Emissions from grading and demolition were estimated using USEPA emission factors, and are shown in Table 4.1-1 (detailed calculations are provided in Appendix A). The types of equipment likely to be used included scrapers, bulldozers, dump trucks, backhoe/loaders, cranes, a water truck, and a roller. Site grading and excavation would generate most of the criteria pollutants. The entire project would last approximately six months.

Table 4.1-1
Estimated Demolition Emissions
Proposed Action (tons per year)

	VOC	PM_{10}	CO	SO_x	NO_x
Demolition emissions	0.44	4.58	3.39	0.56	5.62

Source: Calculated with emission factors from AP-42 (USEPA, 2001; USEPA, 1991).

Air quality is considered good in the North Dakota Air Quality Control Region, which is in attainment for all criteria pollutants. The existing meteorological conditions would disperse pollutants generated by demolition, and no air quality standards would be violated. Impacts to air quality would not be significant.

The demolition activities would have an unavoidable short-term impact on air quality. Demolition activities would generate exhaust emissions from demolition equipment and personal vehicles, and fugitive dust would be generated by earth-disturbing activities. Total emissions would slightly increase if the asphalt were transported offsite (the above analysis assumes stockpiling the asphalt at Cavalier AFS for later reuse). None of these emissions would be significant, given the short duration of time for demolition, the limited types and quantity of equipment to be used, the limited area to be disturbed, and the wind dispersal of the VOCs emitted. Best management practices to reduce fugitive dust emissions, such as daily watering of the disturbed ground as needed and replacing ground cover in disturbed areas as quickly as possible, should be implemented to the maximum extent possible to reduce the amount of these emissions.

4.1.3. Potential Impacts of the Reuse Alternative

Demolition-related emissions would be lower under this Alternative as compared to the Proposed Action (see Table 4.1-2). The amount of PM_{10} generated by implementing this alternative would be slightly lower because Bldgs 705 and 706 would not be demolished. Emissions would be generated from demolition of the water storage reservoir. The amount of emissions generated by demolition equipment would be less than the Proposed Action and impacts to air quality would not be significant.

Table 4.1-2
Estimated Demolition Emissions
Reuse Alternative (tons per year)

	VOC	PM_{10}	CO	SO_x	NO_x
Construction emissions	0.39	4.46	3.10	0.50	5.02
Source: Calculated with emission factors from AP-42 (USEPA, 2001; USEPA, 1991).					

4.1.4. Potential Impacts of the No Action Alternative

Air quality would not change under the No Action Alternative.

4.1.5. Mitigation Measures

Potential emissions are not significant; therefore, no mitigations are necessary or suggested.

4.2. GEOLOGICAL RESOURCES

Impacts to geological resources would result primarily from disturbance of the ground from demolition activities. These activities would affect a shallow layer of the underlying geology in some areas. Excavation, grading, and compaction during demolition would directly impact topography and soils. The Proposed Action would result in about 5.5 acres being disturbed; impacts to soils and the underlying geology would not be significant. About 5 acres would be disturbed under the Reuse Alternative, with slightly less impact than the Proposed Action. Geological resources would not be impacted under the No Action Alternative.

4.2.1. Analysis Methods

The geological resources within the proposed project area were studied to determine the potential impacts from implementing the Proposed Action or Reuse Alternative. Geological studies, a soil survey, previous EAs, and USGS topographical maps were reviewed to characterize the existing environment. Demolition activities that could influence geological resources were evaluated to predict the type and magnitude of potential impacts. For example, soil would be disturbed during demolition of the reservoir and buildings. The predicted post-demolition environment was compared to the existing environment and the change was evaluated to determine if significant changes in any existing conditions would occur.

4.2.2. Potential Impacts of the Proposed Action

Demolition of the water storage reservoir would impact the underlying geological layers to a depth of about 10 feet in an area of approximately 540 by 400 feet (5.0 acres). As discussed in Section 3.3, the soils in this area are sandy loam to a depth of 5 feet, underlain by gravelly sand to a depth of 5 feet. The Binford soil is highly erodible by wind and substantial erosion could occur, potentially causing siltation of an intermittent tributary of the Tongue River about 250 feet northwest of the reservoir. Potential water erosion would generally be limited by slow runoff and the slight slope (generally 1 to 2 percent) in the area. However, siltation of the intermittent stream from soil erosion could occur, especially during or after a heavy rainfall. Best management practices (such as daily watering as needed to control fugitive dust, chemical stabilization, properly installed site fences, maintaining existing vegetation as much as possible, and revegetating sites as soon as possible) would be implemented to reduce the risk of erosion. Due to the sandy texture and droughtiness of the soil, it is difficult to reestablish vegetation on these sites (USDA, 1977). Irrigation of the site may be needed until vegetation is established.

The material underlying soils is sand, silty sand, and gravelly sand to a depth of 13 feet. The water table ranges from 5.3 to 7.6 feet below the surface. The wetness of some materials below the water table may delay or limit the ease of excavations somewhat, but impacts would not be significant. The sandy soil and sediments collapse easily during excavation. Shoring or gentle slopes on excavations may be needed. Bedrock, occurring at about 13 feet, would not be impacted by demolition. After demolition of the water storage reservoir is completed, the site would be filled with about 16,500 cubic yards of borrowed fill material and the site would be graded level with the surrounding area. To avoid sinkholes and drainage problems, the fill material would need to meet engineering specifications and be properly compacted. If these requirements are met, impacts to the geologic layers and their hydrogeologic properties would not be significant. Improper fill or grading could lead to formation of sinkholes and drainage problems such as ponding of water or erosion, but these impacts would not likely be significant. Impacts to geological resources would not be significant with the implementation of best management practices. Impacts to hydrogeology and groundwater are discussed in Section 4.3.

Demolition of the other components for the Proposed Action (Bldgs 705 and 706) could impact soils to a depth of three or four feet and impacts would not be significant. About 0.5 acres would be impacted. The potential for erosion by water and wind is slight in the impacted soils. To minimize water and wind erosion, best management practices (such as watering soil as needed to control fugitive dust) would be implemented. Impacts to soils would not be significant. Underlying geological layers would not be impacted.

4.2.3. Potential Impacts of the Reuse Alternative

Bldgs 705 and 706 would not be demolished under this alternative. The water storage reservoir would be demolished, impacting about 5 acres, as discussed above. Impacts to geological resources and soils would be slightly less than the Proposed Action, and they would not be significant. Best management practices would be implemented to reduce the potential for soil erosion. Fill material and compaction would need to meet engineering requirements to avoid piping and subsidence of the soil.

4.2.4. Potential Impacts of the No Action Alternative

Geological resources would not be impacted under the No Action Alternative.

4.2.5. Mitigation Measures

No significant impacts would result from implementing the Proposed Action and no mitigations are required or recommended.

4.3. WATER RESOURCES

Direct impacts to water resources would result primarily from disturbing the ground during demolition and from altering surface hydrology. The impacts would not be significant. Short-term disturbances from demolition activities could cause wind and water erosion, which could lead to increased sedimentation of nearby surface waters. Implementing best management practices would reduce the potential for erosion and sedimentation. A NPDES permit would be required. Impacts to water resources would not be significant under the Reuse Alternative. Water resources would not be affected under the No Action Alternative.

4.3.1. Analysis Methods

To establish the potential impact of the Proposed Action, Reuse Alternative, and No Action Alternative, documents on the hydrology and hydrogeology of the area, and demolition methods were reviewed. Maps showing topography, watersheds, and storm water drainage were examined. The review focused on the proximity of the project area to surface waters, hydrogeology in the area, water quality in the local area, and evaluated the effects of the actions with regard to those factors.

4.3.2. Potential Impacts of the Proposed Action

Potential impacts to groundwater, surface water, and water quality are discussed in the following sections.

4.3.2.1. Groundwater

The potential for impacts to the local groundwater recharge and water quality of the shallow sand and gravel deposits would result from demolition of the water storage reservoir (after the asphalt is removed and the berms are pushed in). Potential impacts to groundwater could result by spills of diesel fuel or lubricants from demolition equipment and from increased turbidity and dissolved solids from grading of the berms and leveling of the site. The amount of any potential spill would be small and the extent that a spill could potentially travel would be limited by areas of silt and clay deposits, and by shale bedrock at a depth of about 13 feet. Groundwater movement is predominately to the east. A spill is unlikely to occur, but any potential spill would be diluted and filtered by silt and clay sediments to the east of Cavalier AFS. Any spills would be promptly cleaned up in accordance with the Spill Prevention and Response Plan. Any increased turbidity would also be localized by filtering of sediment in the sand deposits. The closest registered domestic and public water supply wells are about three miles north, east, and southeast from Cavalier AFS and would not be impacted by the Proposed Action. The Icelandic

Aquifer, an important source of municipal, domestic, and agricultural water, would not be impacted by the Proposed Action due to its distance from Cavalier AFS (about three miles) and the silt and clay deposits between the aquifer and the AFS. Likewise, the Pembina Delta Aquifer (primarily a source of irrigation water) would not be impacted due to distance and the flow of the Tongue River toward the northeast about 0.5 miles north of Cavalier AFS. The Niobrara Aquifer could be impacted by potential spills during demolition, but potential impacts would not be significant due to filtering by sandy and silty sediments and dispersion through groundwater. There are no registered wells in the Niobrara Aquifer within 4 miles of Cavalier AFS. The Dakota Aquifer, at a depth of 175 to 300 feet, would not be impacted due to nearly impermeable shale between the Niobrara Formation and the Dakota Group (see Section 3.2).

Demolition of Bldgs 705 and 706 would not directly impact the shallow aquifer. Any excavation during demolition would be shallow and above the water table. Any potential spills of fuel or lubricants from equipment could migrate to the underlying aquifer, however, potential impacts would not be significant due to the limited volume of a potential equipment spill, and filtering and dispersion by sediments.

About 5.5 acres would be impacted during demolition. The impermeable asphalt liner of the reservoir would be collapsed into the reservoir and covered with fill material, or removed and reused or recycled. The liner currently covers an area of about 3.3 acres. Collapsing or removing the asphalt would slightly increase the recharge area of the shallow sand deposit aquifers.

There would be no increase in personnel or water use associated with the Proposed Action, and long-term impacts to the aquifers would not be significant.

4.3.2.2. Surface Water

Prior to demolition of the water storage reservoir, the water remaining in storage would be drained to the sewage lagoons. There is currently about three million gallons of water in the reservoir, and the storage capability of the sewage lagoons is about 21.9 million gallons. The sewage lagoons would have sufficient capacity to handle the discharge from the reservoir. Elevated levels of alkyl benzenes and polycyclic aromatic hydrocarbons (around 0.2 to 1.0 micrograms per liter (µg/L)) have been reported in asphalt lined reservoirs (USEPA, 2002). This leaching occurred in water with a pH between 8 and 9, similar to water found in Pembina County. Both of these substances volatilize out of water. The rate of leaching versus volatilization in the reservoir at Cavalier AFS is unknown, but it is likely that levels of alkyl benzenes and polycyclic aromatic hydrocarbons, if present, are low. Water transferred to the sewage lagoons from the reservoir would not be released from the lagoons, but would be left in place to evaporate. If alkyl benzenes and polycyclic aromatic hydrocarbons are present in the water drained into the sewage lagoons, they would volatilize as the water evaporates from the lagoon. Impacts to surface waters would be limited to the drainage ditches and lagoons and would not be significant.

Demolition activities could potentially impact local surface water. The demolition could potentially increase turbidity of nearby surface water due to increased airborne dust and siltation from soil erosion. An intermittent stream, which flows to the Tongue River, heads

about 250 feet northwest of the reservoir. Any sediment entering this stream could impact Tongue River, which is degraded from siltation. The use of standard best management practices, as outlined in a NPDES permit (which would be required for the demolition), would reduce the potential for erosion and sedimentation. Practices to reduce potential erosion include silt traps, chemical stabilizers, and watering of disturbed soil when dry to minimize dust. Impacts to surface waters would not be significant.

4.3.3. Potential Impacts of the Reuse Alternative

This alternative would impact about 5 acres, as compared to 5.5 acres under the Proposed Action. Both ground and surface waters would be impacted by demolition of the reservoir, as described above. Impacts would be slightly less than from the Proposed Action because Bldgs 705 and 706 would not be demolished. A NPDES permit would be required. With the use of best management practices to control potential erosion, as required by the NPDES permit, impacts to water resources would not be significant.

4.3.4. Potential Impacts of the No Action Alternative

The No Action Alternative would have no impact on water resources. Water resources would continue to be impacted at current levels.

4.3.5. Mitigation Measures

Mitigation measures are not required, as no significant impacts from implementing the Proposed Action were identified.

4.4. CULTURAL RESOURCES

Cultural resources are limited, nonrenewable resources whose values may easily be diminished by physical disturbances. There are no known cultural resources within the project area that would be affected as a result of the Proposed Action or Reuse Alternative. Demolition would occur at previously disturbed areas and would therefore have no impact on archaeological resources. Coordination was conducted with the North Dakota State Historical Society who concurred with the "no adverse effect" determination for demolition of the two buildings and water reservoir. There would be no impacts to cultural resources from the No Action Alternative.

4.4.1. Analysis Methods

To determine potential impacts, the analysis focused on the types of activities that would occur, their location, and the significance of the resource in that location. The Comprehensive Planning Framework, Determination of Eligibility Notification for the SRMSC, and an analysis of existing facilities were reviewed to determine the status of historic resources on the installation.

4.4.2. Potential Impacts of the Proposed Action

No known cultural resources have been identified in the project area. The project area has been previously disturbed due to past base operations; therefore, demolition activities in these locations are not anticipated to unearth resources of any importance. There would be no impacts to cultural resources from the demolition activities.

A historic district study was completed for the Perimeter Acquisition Radar Site, Stanley R. Mickelsen Safeguard Complex in 1998 and determined that Bldg 706 (the first structure on Cavalier AFS) had no historic significance (DOI, 1998). As discussed in Section 3.4, the Department of Interior did determine that Bldg 705 and Structure 736 were eligible for inclusion on the National Register of Historic Places as contributing resources. Contributing resources are those that by design, association, and function were present during the period of significance and either contributed to the primary operation of the perimeter radar or provided support and infrastructure for the operation of the overall site. Coordination was conducted with the North Dakota State Historic Preservation Officer concerning demolition of Bldg 705 and Structure 736. He concurred with the "no adverse effect" determination for demolition of Bldg 705 and Structure 736 (see correspondence Appendix E). Therefore, there would be no significant impacts from demolishing Bldg 706, 705, or 736.

As a best management practice, should unknown archaeological resources be uncovered during construction activities, the Air Force would follow procedures described in AFI 32-7065, *Cultural Resource Management*, for coordination with the North Dakota Advisory Council on Historic Preservation.

4.4.3. Potential Impacts of the Reuse Alternative

This alternative would involve the same sites as the Proposed Action and impacts would be the same. There are no anticipated impacts to cultural resources from activities associated with this Alternative.

As would be the case under the Proposed Action, any unknown archaeological resources discovered during renovation activities would be addressed in accordance with AFI 32-7065.

4.4.4. Potential Impacts of the No Action Alternative

For the No Action Alternative, current conditions would not change and no impacts to cultural resources would occur.

4.4.5. Mitigation Measures

No impacts to other cultural resources have been identified and no other mitigation measures are necessary or suggested.

4.5. NOISE

The impacts on the noise environment are related to the magnitude and duration of the noise levels generated during demolition and the proximity of noise-sensitive receptors to the noise source. Noise would be generated during the demolition activities, but the impacts would not be significant. Noise levels would not change under the No Action Alternative.

4.5.1. Analysis Methods

The analysis of noise impacts was based on the assessment of the estimated noise levels generated from the Proposed Action and Alternative and a comparison with ambient noise

levels. The analysis was also based on identifying any sensitive receptors near the proposed activities. Maps of Cavalier AFS were used to determine the locations of sensitive receptors.

4.5.2. Potential Impacts of the Proposed Action

Demolition activity would occur over six months; the noise generated would be short-term and an intermittent impact. In general, demolition activity would be limited to daytime, weekday hours. Given the types of equipment likely to be used in demolishing the buildings and reservoir (e.g., bulldozers, dump trucks, scrapers, backhoe/loaders, cranes, a water truck, and a roller), and the noise levels of the equipment (see Table 3.5-2), typical noise emissions at 50 feet from multiple pieces of demolition equipment would be approximately 90 dBA (U.S. Army, 1978). Assuming a usage factor of 70 percent (on average, any piece of equipment would be used at a maximum operating capacity 70 percent of the time), the L_{eq} at 50 feet would be about 88.5 dBA averaged over 8 hours on a daily basis or 82 dBA averaged over 24 hours on an annual basis. The closest sensitive noise receptor, family housing, is located about 800 feet away from Bldgs 705 and 706, and more than 1,000 feet from the water storage reservoir (Facility 736). At a distance of 800 feet, noise generated from the proposed activities would attenuate to about 65 L_{eq} (8 hours) and 58 L_{eq} (24 hours). These are outdoor levels, the indoor level would be reduced by 20 to 25 dBA. Demolition of the reservoir would generate the majority of the noise due to the longer timeframe and greater extent of demolition as compared to Bldgs 705 and 706. The family housing is located at a sufficient distance away from the project areas to preclude levels noticeably above background levels. Residences in the area around Cavalier AFS would not be impacted, as they are located a sufficient distance from the sites to be demolished. Impacts from noise would not be significant.

The construction contractor would ensure that Air Force personnel are protected from excessive noise exposure. Noise impacts to other receptors would not be significant due to their short-term nature and attenuation by buildings and other structures. Long-term noise levels would be unchanged from current background noise levels.

4.5.3. Potential Impacts of the Reuse Alternative

Impacts from the reuse alternative would be slightly less than Proposed Action, as Bldgs 705 and 706 would not be demolished. Impacts would not be significant.

4.5.4. Potential Impacts of the No Action Alternative

The No Action Alternative would not change the noise environment on the installation.

4.5.5. Mitigation Measures

Mitigation measures are not required, as no significant impacts from implementing the Proposed Action were identified.

4.6. ENVIRONMENTAL JUSTICE

Activities related to demolition of Bldgs 705, 706, and the water reservoir were evaluated to determine if they would disproportionately impact a minority or low-income population,

or children. None of the impacts from proposed demolition of the facilities would be significant, and they would not disproportionately impact a minority or low-income population, or children. No significant environmental justice impacts were identified from the Alternatives.

4.6.1. Analysis Methods

Measures used for impact analysis include demographic and income data obtained from the U.S. Bureau of Census (2002); these data were used to locate minority populations and low-income populations near Cavalier AFS.

To determine if environmental impacts would disproportionately affect minority or low-income populations, an appropriate basis for comparison must be established, and the presence and location of low-income or minority populations must be determined. The population in the vicinity of Cavalier AFS was compared to populations of Pembina County and the State of North Dakota for the determination of potential impacts.

4.6.2. Potential Impacts of the Proposed Action

The Proposed Action would result in a temporary increase of criteria pollutant emissions, noise generated by demolition equipment, and potential impacts to local aquifers. None of these impacts would be significant. The Proposed Action would take place in a sparsely populated area. According to the 2000 U.S. Census, there are only 19 people (other than residents of Cavalier AFS) who live within one mile of the project area. There are no minorities and the percentage of the population below the poverty level within this area is lower than the average for Pembina County and the State of North Dakota. Only four children were identified in this area (a lower percentage than the county and state). Therefore, no disproportionate impacts to minority or low-income populations or children would occur.

4.6.3. Potential Impacts of the Reuse Alternative

Impacts from the Reuse Alternative would be the same as those under the Proposed Action.

4.6.4. Potential Impacts of the No Action Alternative

Under the No Action Alternative, there would be no impacts to environmental justice.

4.6.5. Mitigation Measures

No significant adverse impacts to environmental justice are expected, and no mitigations are required.

4.7. ASBESTOS

The removal and disposal of asbestos as part of the Proposed Action or Reuse Alternative would not result in any significant impacts. Asbestos would not be removed from Bldgs 705 and 706 under the No Action Alternative. Impacts would not be significant.

4.7.1. Analysis Methods

To assess potential impacts, the analysis focused on issues relating to removal and disposal of asbestos. These included a review of state and Federal laws, an asbestos survey, and details of the proposed activities.

4.7.2. Potential Impacts of the Proposed Action

All ACM in Bldgs 705 and 706 (see Section 3.6) would be removed prior to demolition. The removal and disposal of the materials within these facilities would be performed by trained contractor personnel in accordance with all applicable Federal, state, local, and Air Force regulations. In accordance with NDAC 33-15-13-02, the NDDH would be notified 10 days prior to the start of demolition, and any regulated ACM would be disposed of in an approved landfill. The quantity of waste and the short duration of the removal process would not result in a significant impact.

4.7.3. Potential Impacts of the Reuse Alternative

Impacts would be similar to the Proposed Action. If the buildings are sold for reuse, the ACM would be removed prior to the sale of the buildings. As discussed in the Proposed Action, the NDDH would be notified 10 days prior to removal of asbestos, and the asbestos would be removed by certified personnel and disposed of in an approved landfill in accordance with applicable regulations.

4.7.4. Potential Impact of the No Action Alternative

Under the No Action Alternative, the buildings would remain in place and the asbestos would not be removed. A potential health and safety risk would remain, but neither the floor tile or the joint compound are considered friable asbestos, and the risk of exposure would be low. No significant impacts would occur.

4.7.5. Mitigation Measures

No significant impacts have been identified, and no mitigation measures are required or recommended.

4.8. SOLID WASTE

Demolition activities would temporarily increase the amount of solid waste generated by the base. Demolition debris would be disposed of in an inert solid waste landfill. The short-term increase in demolition debris would not have a significant impact. There would be no long-term impacts to solid waste generation at Cavalier AFS. The Reuse Alternative would generate less solid waste, and impacts would not be significant. Demolition debris would not be generated under the No Action Alternative.

4.8.1. Analysis Methods

To assess potential impacts, the analysis focused on issues relating to removal and disposal of solid waste. These included a review of state and Federal laws and details of the Proposed Action.

4.8.2. Potential Impacts of the Proposed Action

Demolition of Bldgs 705 and 706 would generate rubble from steel, concrete, gypsum board, wood, asphalt shingles, glass, and other miscellaneous construction materials. An estimated 535 cubic yards of rubble would be generated during demolition activities (detailed calculations are provided in Appendix D). Debris that cannot be reused or recycled would be managed as inert solid waste and taken to an inert solid waste landfill. Concrete cannot be recycled if ACM (such as floor tile or mastic) is attached to the concrete or is part of the waste stream. As discussed in Section 4.6, ACM in Bldgs 705 and 706 would be removed prior to demolition. Impacts would not be significant.

The water storage reservoir is lined with a 3-inch layer of bituminous asphalt (about 1,320 cubic yards), and an 8-inch layer of compacted aggregate. The asphalt liner that covers the reservoir bottom, inside slopes, and top of dike would either be removed and stockpiled for reuse on the installation or by the county or the top and sides would be collapsed into the reservoir and covered with fill dirt. Burying the material onsite would require a permit as an inert solid waste landfill, regulated under NDAC 33-20-01.1, 33-20-02.1, and 33-20-05.1, or a variance from NDDH. Impacts would not be significant.

4.8.3. Potential Impacts of the Reuse Alternative

Under this Alternative, there would be less demolition debris (solid waste) created, since Bldgs 705 and 706 would be sold for reuse instead of demolished. The asphalt liner of the reservoir would be removed and stockpiled for reuse, or collapsed and buried as inert solid waste as discussed under the Proposed Action. Impacts from disposal of solid waste would not be significant.

4.8.4. Potential Impact of the No Action Alternative

There would be no change in solid waste generation levels under the No Action Alternative.

4.8.5. Mitigation Measures

No significant impacts have been identified, and no mitigation measures are required or recommended.

4.9. COMPATIBILITY OF THE PROPOSED ACTION OR IMPLEMENTATION ALTERNATIVE WITH OBJECTIVES OF FEDERAL, STATE, AND LOCAL LAND USE PLANS, POLICIES, AND CONTROLS

The Proposed Action or Alternative does not conflict with existing Federal, state, and local land use plans, policies, and controls. The Proposed Action or Alternative would occur on Cavalier AFS and in an area of similar land use.

4.10. RELATIONSHIPS BETWEEN SHORT-TERM USES OF THE ENVIRONMENT AND LONG-TERM PRODUCTIVITY

The Proposed Action and Alternative would involve the use of previously developed areas. These lands would be returned to a semi-natural state (grasslands) as demolition is

completed. This would slightly increase habitat available for wildlife in the area. No croplands, pastureland, wooded areas, or wetlands would be modified or affected as a result of implementing the Proposed Action or Alternative and, consequently, productivity of the area would not be degraded.

4.11. CUMULATIVE IMPACTS

Cumulative impacts are those changes to the physical, biological, and socioeconomic environments that would result from the Proposed Action or Alternative in combination with reasonably foreseeable past, present, and future actions. Significant cumulative impacts could result from impacts that are not significant individually, but when considered together, are collectively significant.

The use of construction-related vehicles–and their short-term impacts on noise, air quality, and traffic–is unavoidable. The short-term increases in air emissions and noise during demolition, and the impacts predicted for other resource areas, would not be significant when considered cumulatively with other ongoing and planned activities at Cavalier AFS and nearby off-base areas. There would be no significant cumulative impacts from the Proposed Action. The short-term increases in air emissions, and the non-significant impacts predicted for other resource areas, would not be significant when considered cumulatively with other previous, ongoing, or reasonably foreseeable activities at Cavalier AFS. While other construction would take place on the installation, most of these projects would take place during different timeframes and they would be located in different locations on the installation. All the projects are small in scope, so even those that did occur during the same timeframe, there would not be any significant cumulative impacts.

Any future federal actions that may have potentially significant cumulative impacts to the environment would be assessed in separate NEPA documents.

4.12. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

The Proposed Action or Reuse Alternative would require the use of fill and other construction materials. These materials would be irretrievably committed. The land currently occupied by Bldgs 705, 706, and the water storage reservoir would be restored as vegetated area when demolition is complete.

The Proposed Action or Alternative would also irretrievably consume economic resources, electrical energy, and various types of fuel from demolition activities.

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CHAPTER 5

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5. REFERENCES

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CHAPTER 6

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APPENDIX A

Laws and Regulations

APPENDIX A –
Laws and Regulations

A brief summary of Federal and state laws and regulations that may be applicable to the Proposed Action or Alternatives is provided in the following paragraphs.

Environmental Policy

The *National Environmental Policy Act* of 1969 [42 U.S.C. Sec. 4321, et seq.] establishes national policy, sets goals, and promotes efforts, which will prevent or eliminate damage to the environment and biosphere. The NEPA process is intended to help public officials make decisions that are based on an understanding of environmental consequences, and take actions that protect, restore, and enhance the environment. The process is also intended to provide to the public information regarding the analyses of proposed major Federal actions that may significantly affect the environment.

32 CFR 989 and amended 28 Mar 01, *Air Force Environmental Impact Analysis Process* (EIAP), implements the Air Force EIAP and provides procedures for environmental impact.

Executive Order (EO) 11514, *Protection and Enhancement of Environmental Quality*, as amended by EO 11991, sets the policy for directing the Federal Government in providing leadership in protecting and enhancing the quality of the nation's environment.

Air Quality

The *Clean Air Act* (CAA) [42 U.S.C. Sec. 7401, et seq., as amended] establishes as Federal policy the protection and enhancement of the quality of the Nation's air resources to protect human health and the environment. The CAA sets national primary and secondary ambient air quality standards as a framework for air pollution control.

The *North Dakota Air Quality Standards* [North Dakota Administrative Code (NDAC) Article 33-15] establishes provisions to achieve and maintain the best air quality possible, consistent with the best available control technology, to protect human health, welfare, and property to prevent injury to plant and animal life, to promote the economic and social development of the state, to foster the comfort and convenience for the people, and to facilitate the enjoyment of the natural attractions of the State of North Dakota.

North Dakota Air Pollution Control Act (Title 23), and Regulations establishes provisions for the control of air pollution within the state.

AFI 32-7040, Air Quality Compliance, instructs the Air Force on compliance with the CAA and federal, state, and local regulations.

Water Quality

The *Clean Water Act* (CWA) [33 U.S.C. Sec. 1251, et seq., as amended] establishes Federal limits, through the National Pollution Discharge Elimination System (NPDES), on the amounts of specific pollutants that are discharged to surface waters in order to restore and maintain the chemical, physical, and biological integrity of the water. A NPDES permit, or modification to an existing permit, would be required for any change from the

present parameters in the quality or quantity of wastewater discharge and/or stormwater runoff.

Standards of Water Quality for the State of North Dakota (Chapters 33-16-02). The North Dakota antidegradation policy is found in *33-16-02-01*, and states: "The state of North Dakota, in accordance with the *1972 Federal Water Pollution Control Act*, as amended, declares that state and public policy is to maintain or improve, or both, the quality and purity of the waters of this state. These standards are established for the protection of public health and enjoyment of these waters, to ensure the propagation and well-being of fish, wildlife, and all biota associated or dependent upon said waters, and to safeguard social, economical, and industrial development associated with this resource. The waters of the state include all surface and ground waters of the state as defined in *North Dakota Century Code Section 61-28-01* and those rivers, streams, and lakes forming boundaries between this state and other states or Canada. All known and reasonable methods to control and prevent pollution of the waters of this state are required, including improvement in water quality, when feasible."

The *North Dakota Century Code, Section 61-28-01*, and *Section 33-16-02-01* of the regulation both state that "it is hereby declared to be the policy of the state of North Dakota to act in the public interest to protect, maintain, and improve the quality of the waters in the state for continued use as public and private water supplies, propagation of wildlife, fish and aquatic life, and for domestic, agricultural, industrial, recreational, and other legitimate beneficial uses, to require necessary and reasonable treatment of sewage, industrial, or other wastes."

The Department of Health and Consolidated Laboratories, North Dakota Title 33, Article 16 discusses the control, prevention, and abatement of pollution of surface waters and *Article 17* governs public water supply systems.

North Dakota Water Pollution Control Act (Title 61), establishes provisions for the control and prohibition of water pollution within the state. No installation that is reasonably expected to be a source of water pollution may be operated, maintained, constructed, expanded, or modified without an appropriate permit issued by the department.

AFI 32-7041*, Water Quality Compliance*, instructs the Air Force on how to assess, attain, and sustain compliance with the CWA and federal, state, and local environmental regulations.

Biological Resources

The *Endangered Species Act* [16 U.S.C. Sec. 1531-1543] requires Federal agencies that authorize, fund, or carry out actions to avoid jeopardizing the continued existence of threatened or endangered species and to avoid destroying or adversely modifying their critical habitat. Federal agencies must evaluate the effects of their actions on threatened or endangered species of fish, wildlife, and plants, and their critical habitats, and take steps to conserve and protect these species. All potentially adverse impacts to threatened and endangered species must be avoided or mitigated.

The *Migratory Bird Treaty Act* [16 U.S.C. Sec. 703-711] imposes substantive obligations on Federal agencies to protect migratory birds and their habitats.

AFI 32-7064*, Integrated Natural Resource Management*, provides the Air Force with guidance on compliance with the *Endangered Species Act* and Federal, state, and local environmental regulations.

Cultural Resources

The *National Historic Preservation Act* (NHPA) of 1966 [16 U.S.C. Sec. 470, et seq., as amended] requires Federal agencies to determine the effect of their actions on cultural resources and take certain steps to ensure these resources are located, identified, evaluated, and preserved.

The *Archaeological Resources Protection Act* (ARPA) [16 U.S.C. Sec. 470a-11, as amended] protects archeological resources on Federal lands. If archaeological resources are discovered that may be disturbed during site activities, the Act requires permits for excavating and removing the resource.

AFI 32-7065*, Cultural Resource Management*, provides the Air Force with guidance on compliance with the NHPA, ARPA, and applicable Federal, state, and local regulations.

Solid Waste

North Dakota Administrative Code (NDAC 33-20-01.1-03) *Solid Waste Management and Land Protection*, provides the performance criteria and standards for the management of solid waste in a manner that will control nuisance and litter, protect the public health, safety, and welfare, and prevent or minimize injury of environmental resources from exposure to solid waste or constituents of solid waste.

AFI 32-7042*, Solid and Hazardous Waste Compliance*, provides guidance to the Air Force on compliance with RCRA and applicable federal, state, and local regulations.

Environmental Justice

EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations*, directs Federal agencies to identify and address any disproportionately high and adverse human or environmental impacts of Federal actions on minority or low-income populations.

Environmental Justice also takes into consideration EO 13045, Protection of Children from *Environmental Health Risks and Safety Risks*, which was signed by the President on April 21, 1997. This EO requires that each Federal agency identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on children, who are more at risk because of developing body systems, comparatively higher consumption-to-weight ratios, behaviors that may expose them to more risks and hazards than adults, and less ability than adults to protect themselves from harm.

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APPENDIX B

Notice of Availability

APPENDIX B –
Notice of Availability

This section includes a copy of the Notice of Availability that was published in the Cavalier County Republican and Cavalier Chronicle newspapers on August 20th and 25th, 2003, respectively.

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VISIT THE CAVALIER CHRONICLE FOR YOUR OFFICE SUPPLY NEEDS

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CLASS SIZES ARE LIMITED! CLASS SIZES ARE LIMITED!

NOTICE OF AVAILABILITY DRAFT ENVIRONMENTAL ASSESSMENT AND DRAFT FINDING OF NO SIGNIFICANT IMPACT FOR DEMOLITION OF STRUCTURES AT CAVALIER AFS, NORTH DAKOTA

An Enviromental Assessment (EA) has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, as amended, and the Council on Environmental Quality Regulations implementing NEPA to analyze the potential environmental consequences of demolishing two buildings and a water reservoir at Cavalier AFS. The Air Force proposes to dispose of structures that are excess to the needs of the current mission, have outlived their usefulness, or present safety concerns to base personnel. The EA analyzes potential impacts from demolition to air quality; geology and soils; groundwater and surface water; cultural resources; noise, environmental justice, asbestos, and solid waste. A Reuse Alternative and the No Action Alternative were also analyzed in the EA. The Draft EA and Draft Finding of No Significant Impact (FONSI), dated August 2003, are available for review at the following locations:

Cavalier Public Library
106A W 2nd Ave South - Cavalier, ND 58220
Phone (701) 265-4746

Cavalier County Public Library
600 5th Ave - Langdon, ND 58249
Phone (701) 256-5353

Public comments on the EA will be accepted through September 5, 2003. Written comments and inquiries on the EA should be directed to Ms Jean Kotchman, Mason & Hanger Corporation, 830 Patrol Road, #234, Cavalier AFS, ND 58220. Fax: (701) 993-3660. Email: jean.kotchman@cavalier.af.mil

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APPENDIX C

Air Emission Calculations

APPENDIX C –
Air Emission Calculations

This section includes the calculations performed for estimating air emissions generated from activities related to the Alternatives. Emissions were estimated using emission factors from AP-42 (USEPA, 2001a) and the Non-road Engine and Vehicle Emission Study (USEPA, 1991).

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Table C-2 Reuse Alternative, Estimated Air Emissions from Demolition of Bldgs…… C-7

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Table C-1 Estimated Air Emissions from Demolition of Buildings 705, 706, and 736

Proposed Action

Emissions Years - CY03

6 months to demolish (120 work days)

This table includes calculations performed for estimating air emissions generated from activities related to the demolition of buildings 705, 706, and 736.

Emissions were estimated using emission factors from AP-42 (USEPA, 2001) and the Non-road Engine and Vehicle Emission Study (USEPA, 1991).

Summary (emissions in tons per year)

CO	VOC	NOx	SOx	PM-10
3.39	**0.44**	**5.62**	**0.56**	**4.58**

Summary (emissions in tons per day)

CO	VOC	NOx	SOx	PM-10
0.03	**0.00**	**0.05**	**0.00**	**0.04**

PM_{10} emissions from bulldozing

$PM = \frac{1.0 * s^{1.5}}{M^{1.4}}$		0.876	lb/hr PM	720	hours
		0.66	lbs/hr PM_{10}	473.2	lbs PM_{10}
				0.24	**tons PM_{10}**

where s = silt (%), M = moisture (%)

PM_{10} = PM * 0.75

Sandy loam and loamy sand are typically 10-20 percent silt, an average of 15 percent was used.

20 percent soil moisture was assumed.

PM_{10} from Building Demo

0.00042	lbs/ft^3 of building volume, times days
109,080	ft^3 building total debris from outer walls, inner walls, floors and ceilings
137.4	lbs PM_{10}
0.07	**tons PM_{10}**

Demo Water Reservoir (736)

Equipment	Days	Hours/day	Pieces	CO	VOC	NOx	SOx	PM-10
Scraper	30	8	4	*2.94*	*0.27*	*5.07*	*0.53*	*0.80*
Emissions (lbs)				2819.52	256.32	4870.08	512.64	768.96
Bulldozer	60	8	4	*1.03*	*0.21*	*2.16*	*0.21*	*0.21*
Emissions (lbs)				1975.68	395.14	4148.93	395.14	395.14
Rubber tired loader	3	8	4	*1.74*	*0.32*	*3.63*	*0.32*	*0.47*
Emissions (lbs)				166.85	30.34	348.86	30.34	45.50
Dump Truck	3	8	4	*1.80*	*0.19*	*4.17*	*0.45*	*0.26*
Emissions (lbs)				172.80	18.24	400.32	43.20	24.96
Water Truck	10	1	1	*1.80*	*0.19*	*4.17*	*0.45*	*0.26*
Emissions (lbs)				18.00	1.90	41.70	4.50	2.60
Roller	5	8	2	*0.68*	*0.17*	*2.03*	*0.22*	*0.17*
Emissions (lbs)				54.08	13.96	162.24	17.44	13.61
Total Emissions	lbs			5206.93	715.89	9972.13	1003.26	1250.77
	tons			**2.60**	**0.36**	**4.99**	**0.50**	**0.63**

Demolition of Buildings 705 and 706

Equipment	Days	Hours/day	Pieces	CO	VOC	NOx	SOx	PM-10
Crane	10	4	1	*1.75*	*0.58*	*4.46*	*0.39*	*0.58*
Emissions (lbs)				69.84	23.28	178.48	15.52	23.28
Backhoe/loader	20	8	1	*1.16*	*0.23*	*1.69*	*0.15*	*0.15*
Emissions (lbs)				184.80	36.96	271.04	24.64	24.64
Bulldozer	5	8	1	*1.03*	*0.21*	*2.16*	*0.21*	*0.21*
Emissions (lbs)				41.16	8.23	86.44	8.23	8.23
Dump Truck	10	8	2	*1.80*	*0.19*	*4.17*	*0.45*	*0.26*
Emissions (lbs)				288.00	30.40	667.20	72.00	41.60
Total Emissions	lbs			583.80	98.87	1203.16	120.39	97.75
	tons			**0.29**	**0.05**	**0.60**	**0.06**	**0.05**
Total Construction Equipment Emissions			lbs	5790.73	814.76	11175.29	1123.65	1348.52
			tons	**2.90**	**0.41**	**5.59**	**0.56**	**0.67**
Worker Vehicle Trips								
Exhaust				**CO**	**VOC**	**NOx**	**SOx**	**PM-10**
Number of workers	20		EF (g/mi)	9.387	0.598	0.655	0	0
Commute (miles)	20		lbs/mi	0.020676211	0.001317181	0.001442731	0	0
Days	120		Amt (lbs)	992.46	63.22	69.25	0.00	0.00
Total Miles	48,000		**Amt (tons)**	**0.50**	**0.03**	**0.03**	**0.00**	**0.00**
EF = Emission Factor for calendar year 2000 (USEPA, 2000b) in grams per mile								
PM-10 Trucks Driving on Paved Roads								
Miles/round trip	10							
Trucks/hour	4							
Hours of activity	8							
Days	30		EF (lbs/mile)	0.4	with street cleaning			
VMT	9600		TOTAL (lbs)	3840	**Total (tons)**	**1.92**		
PM-10 Trucks Driving on Unpaved Roads								
Miles/round trip	2		EF = $2.6(s/12)^{0.8}(W/3)^{0.4}$			6.959		
Trucks/hour	4		$(M/0.2)^{0.3}$			3.981		
Hours of activity	8					**1.748**	**EF**	
Days	30		where s = silt (%), M = moisture (%), W = mean vehicle weight (tons)					
VMT	1920		EF = emission factor for PM10 on unpaved roads (uncontrolled)					
EF (lbs/mile)	1.748		Sandy loam are typically 10-20 percent silt,					
TOTAL (lbs)	3356.04		an average of 15 percent was used.					
Total (tons)	**1.68**		10 percent surface moisture was assumed for unpaved roads.					
			Emission factor formula from AP-42 Chapter 13.2.2					
SUMMARY	Amounts in tons							
	CO	**VOC**	**NOx**	**SOx**	**PM-10**			
Grading (fugitive dust)					0.24			
Trucks - paved roads					1.92			
Trucks - unpaved roads					1.68			
Construction Equipment	2.90	0.41	5.59	0.56	0.67			
Worker Vehicles	0.50	0.03	0.03	0.00	0.00			
Building demo	0.00	0.00	0.00	0.00	0.07			
TOTAL Construction	**3.39**	**0.44**	**5.62**	**0.56**	**4.58**			
TONS PER YEAR	**3.39**	**0.44**	**5.62**	**0.56**	**4.58**			

Pounds	6783	878	11245	1124	9155			
Pounds / day avg	**57**	**7**	**94**	**9**	**76**			
Tons/day avg	**0.03**	**0.00**	**0.05**	**0.00**	**0.04**			
Sources:								
USEPA, 2001								
USEPA, 1991								
Assumptions								
Demo of water reservoir (120 days)								
Scraper (4) 30 days Fill for reservoir								
Bulldozer (4) 60 days Grade sides of reservoir and fill								
Rubber tired loader (4) 3 days asphalt removal								
Dump Truck (4) 3 days asphalt removal								
Water Truck 10 days (1 hour per day)								
Roller (2) 5 days compacting fill								
Demolition of Buildings 705 and 706 (30 days)								
Crane (1) 10 days								
Dump Truck (2) 10 days								
Backhoe 20 days (load rubble, utilities removal, final grading)								
Bulldozer 5 days grading								
Reservoir Fill								
Estimated volume fill required								
			16,515	cubic yards				
Moving earth			17	cubic yards per scraper				
			971	scraper loads				
			1	hours per scraper load				
			8	loads per scraper per day				
			4	scrapers				
			32	total loads per day				
			30	days				
			1.5	months				
			243	hours				
The amount of earth to be used for fill was estimated using topographic contours for the site area and as built engineering								
drawings, assumes a suitable fill borrow site within 5 miles of Cavalier AFS								
Asphalt removal								
			1,320	cubic yards				
			12	cubic yards per dump truck				
			110	dump truck loads				
			1	hours per scraper load				
			8	loads per dump truck per day				
			4	dump trucks				
			32	total loads per day				
			3	days				
			0.2	months				
			28	hours				
Approximate volume of asphalt at reservoir								
Thickness of asphalt (ft)			0.25					
Length (ft)			460					

Width (ft)			310					
Volume (cu ft)			35650					
Volume (cu yards)			**1320.4**					
Dump truck capacity			12	cu yards				
Dump truck loads			**110**					
Approximate volume of fill needed at reservoir								
Area below grade								
Rectangular area 186 ft by 216 ft by 10 ft			401,760	cubic feet				
2 Rectangular areas 60 ft by 60 ft by 10 ft			72,000	cubic feet				
Frustum area of 4 rounded areas combined[1]			184,139	cubic feet				
2 Triangular areas 60 ft by 30 ft by 10 ft			18,000	cubic feet				
2 Triangular areas 216 ft by 34 ft by 10 ft			73,440	cubic feet				
Total area below grade			**749,339**	**cubic feet**				
[1] Frustum with radius one of 92 feet, radius two of 60 feet, and a height of 10 feet								
Area below grade based on leveling wirth surrounding 1175 ft elevation, bottom of reservoir is 1165 ft above sea level								
Above ground area								
Trapeziodal area along sides of berm			201,480	cubic feet				
Trapeziodal area around curved area of berm			137,602	cubic feet				
Total area above grade			**339,082**	**cubic feet**				
Area above grade is the portion of the berm above 1175 ft (maximum elevation of the berm is 1184 ft)								
Fill needed			**410,257**	**cubic feet**				
Asphalt removed			35650	cubic feet				
Net fill needed			**445,907**	**cubic feet**				
			16,515	**cubic yards**				
Scraper capacity			17	cu yards				
Scraper loads			**971**	**truck loads**				
Aggregate from base				**Aggregate from sub-base**				
Thickness of base (ft)			0.67	Thickness of base (ft)			0.83	
Length (ft)			460	Length (ft)			460	
Width (ft)			310	Width (ft)			310	
Volume (cu ft)			95542	Volume (cu ft)			118358	
Volume (cu yards)			3538.6	Volume (cu yards)			4383.6	
				Aggregate is assumed to be used for fill				
Aggregate is assumed to be used for fill								

Table C-2 Estimated Air Emissions from Demolition of Buildings 705, 706, and Structure 736

Reuse Alternative

Emissions Years - CY03

6 months to demolish (120 work days)

This table includes calculations performed for estimating air emissions generated from activities related to the demolition of building 736 (water storage reservoir).
Emissions were estimated using emission factors from AP-42 (USEPA, 2001) and the Non-road Engine and Vehicle Emission Study (USEPA, 1991).

Summary (emissions in tons per year)

CO	VOC	NOx	SOx	PM-10
3.10	**0.39**	**5.02**	**0.50**	**4.46**

Summary (emissions in tons per day)

CO	VOC	NOx	SOx	PM-10
0.03	**0.00**	**0.04**	**0.00**	**0.04**

PM_{10} emissions from bulldozing

$PM = \frac{1.0 * s^{1.5}}{M^{1.4}}$		0.876	lb/hr PM	720	hours
		0.66	lbs/hr PM_{10}	473.2	lbs PM_{10}
				0.24	**tons PM_{10}**

where s = silt (%), M = moisture (%)
PM_{10} = PM * 0.75

Sandy loam and loamy sand are typically 10-20 percent silt, an average of 15 percent was used.
20 percent soil moisture was assumed.

Demo Water Reservoir (736)

Equipment	Days	Hours/day	Pieces	CO	VOC	NOx	SOx	PM-10
Scraper	30	8	4	*2.94*	*0.27*	*5.07*	*0.53*	*0.80*
Emissions (lbs)				2819.52	256.32	4870.08	512.64	768.96
Bulldozer	60	8	4	*1.03*	*0.21*	*2.16*	*0.21*	*0.21*
Emissions (lbs)				1975.68	395.14	4148.93	395.14	395.14
Rubber tired loader	3	8	4	*1.74*	*0.32*	*3.63*	*0.32*	*0.47*
Emissions (lbs)				166.85	30.34	348.86	30.34	45.50
Dump Truck	3	8	4	*1.80*	*0.19*	*4.17*	*0.45*	*0.26*
Emissions (lbs)				172.80	18.24	400.32	43.20	24.96
Water Truck	10	1	1	*1.80*	*0.19*	*4.17*	*0.45*	*0.26*
Emissions (lbs)				18.00	1.90	41.70	4.50	2.60
Roller	5	8	2	*0.68*	*0.17*	*2.03*	*0.22*	*0.17*
Emissions (lbs)				54.08	13.96	162.24	17.44	13.61
Total Emissions	lbs			5206.93	715.89	9972.13	1003.26	1250.77
	tons			**2.60**	**0.36**	**4.99**	**0.50**	**0.63**

Worker Vehicle Trips

Exhaust				CO	VOC	NOx	SOx	PM-10
Number of workers	20		EF (g/mi)	9.387	0.598	0.655	0	0
Commute (miles)	20		lbs/mi	0.020676211	0.001317181	0.001442731	0	0
Days	120		Amt (lbs)	992.46	63.22	69.25	0.00	0.00
Total Miles	48,000		**Amt (tons)**	**0.50**	**0.03**	**0.03**	**0.00**	**0.00**

EF = Emission Factor for calendar year 2000 (USEPA, 2000b) in grams per mile

PM-10 Trucks Driving on Paved Roads								
Miles/round trip	10							
Trucks/hour	4							
Hours of activity	8							
Days	30		EF (lbs/mile)	0.4	with street cleaning			
VMT	9600		TOTAL (lbs)	3840	**Total (tons)**	**1.92**		
PM-10 Trucks Driving on Unpaved Roads								
Miles/round trip	2		$EF = 2.6(s/12)^{0.8}(W/3)^{0.4}$			6.959		
Trucks/hour	4		$(M/0.2)^{0.3}$			3.981		
Hours of activity	8					**1.748**	**EF**	
Days	30		where s = silt (%), M = moisture (%), W = mean vehicle weight (tons)					
VMT	1920		EF = emission factor for PM10 on unpaved roads (uncontrolled)					
EF (lbs/mile)	1.748		Sandy loam are typically 10-20 percent silt,					
TOTAL (lbs)	3356.04		an average of 15 percent was used.					
Total (tons)	**1.68**		10 percent surface moisture was assumed for unpaved roads.					
			Emission factor formula from AP-42 Chapter 13.2.2					
SUMMARY	Amounts in tons							
	CO	**VOC**	**NOx**	**SOx**	**PM-10**			
Grading (fugitive dust)					0.24			
Trucks - paved roads					1.92			
Trucks - unpaved roads					1.68			
Construction Equipment	2.60	0.36	4.99	0.50	0.63			
Worker Vehicles	0.50	0.03	0.03	0.00	0.00			
TOTAL Construction	**3.10**	**0.39**	**5.02**	**0.50**	**4.46**			
TONS PER YEAR	**3.10**	**0.39**	**5.02**	**0.50**	**4.46**			
Pounds	6199	779	10041	1003	8920			
Pounds / day avg	**52**	**6**	**84**	**8**	**74**			
Tons/day avg	**0.03**	**0.00**	**0.04**	**0.00**	**0.04**			
Sources:								
USEPA, 2001								
USEPA, 1991								
Assumptions								
Demo of water reservoir (120 days)								
Scraper (4) 30 days Fill for reservoir								
Bulldozer (4) 60 days Grade sides of reservoir and fill								
Rubber tired loader (4) 3 days asphalt removal								
Dump Truck (4) 3 days asphalt removal								
Water Truck 10 days (1 hour per day)								
Roller (2) 5 days compacting fill								
Reservoir Fill								
Estimated volume fill required								
			16,515	cubic yards				
Moving earth			17	cubic yards per scraper				
			971	scraper loads				

			1	hours per scraper load				
			8	loads per scraper per day				
			4	scrapers				
			32	total loads per day				
			30	days				
			1.5	months				
			243	hours				
The amount of earth to be used for fill was estimated using topographic contours for the site area and as built engineering								
drawings, assumes a suitable fill borrow site within 5 miles of Cavalier AFS								
Asphalt removal								
			1,320	cubic yards				
			12	cubic yards per dump truck				
			110	dump truck loads				
			1	hours per scraper load				
			8	loads per dump truck per day				
			4	dump trucks				
			32	total loads per day				
			3	days				
			0.2	months				
			28	hours				
Approximate volume of asphalt at reservoir								
Thickness of asphalt (ft)			0.25					
Length (ft)			460					
Width (ft)			310					
Volume (cu ft)			35650					
Volume (cu yards)			**1320.4**					
Dump truck capacity			12	cu yards				
Dump truck loads			**110**					
Approximate volume of fill needed at reservoir								
Area below grade								
Rectangular area 186 ft by 216 ft by 10 ft			401,760	cubic feet				
2 Rectangular areas 60 ft by 60 ft by 10 ft			72,000	cubic feet				
Frustum area of 4 rounded areas combined[1]			184,139	cubic feet				
2 Triangular areas 60 ft by 30 ft by 10 ft			18,000	cubic feet				
2 Triangular areas 216 ft by 34 ft by 10 ft			73,440	cubic feet				
Total area below grade			**749,339**	**cubic feet**				
[1] Frustum with radius one of 92 feet, radius two of 60 feet, and a height of 10 feet								
Area below grade based on leveling wirth surrounding 1175 ft elevation, bottom of reservoir is 1165 ft above sea level								
Above ground area								
Trapeziodal area along sides of berm			201,480	cubic feet				
Trapeziodal area around curved area of berm			137,602	cubic feet				
Total area above grade			**339,082**	**cubic feet**				
Area above grade is the portion of the berm above 1175 ft (maximum elevation of the berm is 1184 ft)								
Fill needed			**410,257**	**cubic feet**				
Asphalt removed			35650	cubic feet				
Net fill needed			**445,907**	**cubic feet**				
			16,515	**cubic yards**				

Scraper capacity			17	cu yards				
Scraper loads			**971**	**truck loads**				
Aggregate from base				**Aggregate from sub-base**				
Thickness of base (ft)			0.67	Thickness of base (ft)			0.83	
Length (ft)			460	Length (ft)			460	
Width (ft)			310	Width (ft)			310	
Volume (cu ft)			95542	Volume (cu ft)			118358	
Volume (cu yards)			3538.6	Volume (cu yards)			4383.6	
				Aggregate is assumed to be used for fill				
Aggregate is assumed to be used for fill								

APPENDIX D

Solid Waste Calculations

APPENDIX D –
Solid Waste Calculations

This section includes the calculations performed for estimating solid waste volumes from demolition of the buildings.

Table of Contents

Table D-1 Estimated Solid Waste Volume from Demolition of Bldgs……..….D-3

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Table D-1 Estimated Solid Waste Volume from Demolition of Buildings 705 and 706	
Proposed Action	
Construction Debris	
Total waste	
155	lbs/foot^2 of waste from building space
10,908	square footage of buildings
1	levels in buildings
10,908	total square footage
1,690,740	lbs of waste
845	tons of waste
Concrete	
75	percent concrete
634	tons of concrete rubble
150	density of concrete (lbs/ft^3)*
13	ft^3/ton concrete
80	average percent density of rubble
17	ft^3/ton concrete rubble
10,567	volume of waste (ft^3) (concrete)
Wood	
5	percent wood
42	tons of wood rubble
35	density of wood (lbs/ft^3)*
57	ft^3/ton wood
80	average percent density of rubble
71	ft^3/ton wood rubble
3,019	volume of waste (ft^3) (wood)
Steel	
20	percent steel
169	tons of steel rubble
490	density of steel (lbs/ft^3)*
4	ft^3/ton steel
80	average percent density of rubble
5	ft^3/ton steel rubble
863	volume of waste (ft^3) (steel)
Total Rubble	
14,449	cubic feet rubble
535	cubic yards rubble
Assumptions	
Amount of waste generated from demolition (lbs/foot2) of building space is based on esimates from USAF,	
1999c. An average rate for non-residential buildings is 155 lbs/ft^2.	
Percent concrete, wood, and steel is derived from USAF, 1999c	
* Density of concrete, wood, and steel is from efunda.com	
This amount of landfill volume assumes that steel and other metals, comprising about 25 percent of demolition	
waste, would not be recycled.	
Glass and other materials, which typically comprise less than 10 percent of the total material, were not calculated,	
however, they have a density similar to concrete.	

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APPENDIX E

STATE HISTORIC PRESERVATION OFFICER CORRESPONDENCE

APPENDIX E –
State Historic Preservation Officer

This section includes a letter from the North Dakota State Historic Preservation Officer concurring with the "No Adverse Effect" determination for demolition of Buildings 705 and 736.

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STATE HISTORICAL SOCIETY OF NORTH DAKOTA

COPY

August 29, 2003

Colonel Jeffrey C. Smith
Department of the Army, Environmental Division
U.S. Army Space and Missile Defense Command
P.O. Box 1500
Huntsville, AL 35807-3801

ND SHPO Ref.: 92-0119, Four Projects at the Cavalier Air Force Station, Pembina County, ND.

Colonel Smith:

We have reviewed Project: 92-0119, proposed security fencing, demolition of Buildings 705 and 736, and construction of a new guardhouse entry facility at the Cavalier Air Force Station in Pembina County, ND.

We concur with "No Adverse Effect" determination for the four projects provided that they are of the nature specified and take place in the legal descriptions listed and plotted in the correspondence. We also concur that photos and existing plans for Building 736 be archived with the 1996 HAER documentation.

Thank you for the opportunity to review this project. Please include the ND SHPO Reference number listed above in any further correspondence for this specific project. If you have any questions please contact Duane Klinner at (701) 328-3576.

Sincerely,

Merlan E. Paaverud, Jr.
State Historic Preservation Officer
(North Dakota)

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